DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, U.S. ARMY CORPS OF ENGINEERS
P.O. BOX 1715
BALTIMORE, MD 21203-1715

February 28, 2001

REPLY TO
ATTENTION OF
Programs and Project
Management Division

Honorable John D. Dingell
2328 Rayburn House Office Building
Washington, DC 20515-2216

Dear Mr. Dingell:

This is in response to the questions and information requests posed in your letter to me dated January 25, 2001. At this time, I am providing responses to all but one of the questions, which, in accordance with previous arrangements, will be delivered no later than March 14, 2001.

In order to facilitate your staff's research, I have included in this response a copy of my testimony to the District of Columbia City Council on February 14, 2001, which provides an overview of the U.S. Army's activities in Spring Valley since 1993. I hope you and your staff find the enclosed responses sufficient; however, my staff is prepared to offer whatever assistance or additional information you may need. Please feel free to contact me directly at (410) 962-4545, or have your staff contact Captain Mike Peloquin at (410) 962-0157.

Sincerely,

Charles J. Fiala, Jr.
Colonel, Corps of Engineers
District Engineer

Enclosures

Contents

Congress of the United States
House of Representatives
Washington, DC 20515

January 25, 2001

Colonel Charles J. Fiala, Jr.
Commander
U.S. Army Corps of Engineers
Baltimore District
P.O. Box 1715
Baltimore, Maryland 21203-1715

Dear Colonel Fiala:

During the past several months, Minority staff from the Committee on Energy and Commerce has met with officials from both the Environmental Protection Agency (EPA) and the Army Corps of Engineers (Army Corps) to determine the status of the ongoing cleanup effort at Spring Valley, a residential community located in Northwest Washington, D.C. Sections within Spring Valley were constructed on or in close proximity to a number of World War I munitions development and testing sites. These include sites used in the creation and testing of both explosive ordinance and chemical agents.

Over a period of almost ten years, there appear to have been several stops and starts to this project which leads me to question whether the Army Corps yet understands the full scope of this problem or whether it has determined what resources it will ultimately need to address all areas of contamination and potential danger to the residents of Spring Valley and the American University community. For instance, I read with interest the recent revelation that levels of arsenic contamination much higher than previously shown have been found at the American University child care center. It is perplexing to me that after so many years of study of this area that the Army Corps would find information in such dramatic contrast to what was previously known about the condition of the area.

In light of this recent revelation about arsenic levels at the child care center, it is equally as perplexing that after two years of investigation and cleanup at the Spring Valley site, in June of 1995, the Army Corps issued a Record of Decision for No Further Action. This, as reported to my staff, meant that the Army Corps determined that *no additional cleanup or testing* would be required at the Spring Valley site. Clearly, this was a flawed conclusion.

As I understand events after 1995, officials from the District of Columbia Department of Health raised a number of questions about the early investigation of the site. Ultimately, the Army Corps reexamined certain areas of the Spring Valley site for additional ordinance

(including canisters that may contain mustard gas), and other agents, including arsenic. It remains unclear how the need for additional work surfaced, given that earlier assessments seemed to conclude that no further cleanup action was necessary. As additional work progressed, a number of new sites containing high levels of arsenic were found. In addition, a determination also was made that certain previously identified sites were incorrectly located in the original 1993-1995 work. Officials of the EPA and the District of Columbia Department of Health continue to review aerial photos, geophysical surveys, and other archived records that may lead to the identification of additional anomalies.

According to press accounts, additional tests are now being conducted to determine the pervasiveness of the arsenic problem. District health officials have requested the voluntary testing of children for arsenic exposure. During last year and continuing to this day, a wide section of soil adjacent to the Korean ambassador's home (along with other nearby residences) is being removed and tested. Additional tests are being conducted throughout the Spring Valley area, though it remains unclear what the scope of those activities will be or what the Army Corps ultimately expects to find.

In order to better understand this effort and the potential risks that may be posed to the Spring Valley community, please respond to the attached questions relating to the EPA and Army Corps' cleanup efforts in the Spring Valley community. I appreciate your answer to these questions and document requests on or before March 1, 2001. Should you have any questions about this request, please contact me, or have your staff contact either Christopher Knauer (202/226-3400) or Richard Frandsen (202/225-3641) of the Minority staff.

Sincerely,

John D. Dingell
Ranking Member
Committee on Energy and Commerce

Attachment

cc: Mr. Michael McCabe, Acting Administrator
Environmental Protection Agency

Dr. Ivan Walks, Director
D.C. Department of Health

QUESTIONS AND REQUESTS
FOR THE ARMY CORPS OF ENGINEERS
BALTIMORE DISTRICT

1. What is the full inventory of hazardous materials, including both munitions and contaminants, now being addressed in the vicinity of the Spring Valley site?

   a) Please provide a full listing of the inventory.

   b) What additional materials are suspected, if any?

   c) What are the likely origins of known and suspected materials, including munitions and contaminants, in the Spring Valley vicinity (for instance, research labs, testing pits)?

2. What financial resources, including both federal and local, are budgeted for FY 2001 to investigate, remediate, oversee, assess, and conduct removals in the vicinity of the Spring Valley site?

   a) Please provide a breakdown, by agency, FTE, and task, of the annual financial resources expended from FY 1993 to FY 2000 to investigate, remediate, oversee, assess, and conduct removals in the vicinity of the Spring Valley site.

3. What tests and techniques are currently being used to define the full scope of the hazardous materials, munitions, and other contamination existing in the vicinity of the Spring Valley site?

4. What is currently known about the potential short-term as well as long-term health risks (if any), to the residents of the Spring Valley neighborhood as well as the American University community?

   a) Have any cancer or health studies been conducted on or in proximity to the Spring Valley properties? If so, please provide these studies.

   b) Is the Army Corps willing to fund a full epidemiological study pursuant to the request of the D.C. Government?

5. Provide a copy of all arsenic test results in the vicinity of the Spring Valley site, including the results for the American University child care center. Please indicate how deep the elevated levels have been found in the soil as a result of core borings.

6. Provide a map of the locations of all munitions found in the vicinity of the Spring Valley site, and the date upon which they were found.

7. Provide all copies of Remedial Investigations and Anomaly Board Reports pertaining to the vicinity of the Spring Valley site.

8. Provide all contractors' reports pertaining to the entire Spring Valley site.

9. Provide information pertaining to the law suit or claims brought on behalf of the Korean Government pertaining to the residence located in the vicinity of the Spring Valley site, including the amount and nature of the claim and schedule for court disposition, if any.

10. Are there, or have there been, any other law suits against the United States Government pertaining to the Spring Valley site? If so, provide the nature and amount of claim and disposition, if any.

11. Does the Army Corps provide the Environmental Protection Agency or the D.C. Department of Health with any funding for oversight activities at Spring Valley? If so, please identify the funding that has been provided to each oversight agency.

12. Why was activity stopped at the Holmes property (OU2) after elevated arsenic levels were reportedly detected and other anomalies had not been investigated? What are the Army Corps plans for further investigation of this residential property? Does the manner in which this site was handled indicate a problem with the anomaly review board process?

13. Is the Army Corps listing specific results of its sampling data or core borings on its Spring Valley Web site explaining the significance of the sampling results to the citizens? If not, please explain why not? Also, please describe what information, and in what form (*e.g.*, written correspondence, verbal or other) information about cleanup activities is provided to residents of the Spring Valley community.

DEPARTMENT OF THE ARMY
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REPLY TO
ATTENTION OF
Programs and Project
Management Division

FEB 13 2001

Honorable John D. Dingell
2328 Rayburn House Office Building
Washington, DC 20515-2216

Dear Mr. Dingell: SIR—

We have reviewed the questions and requests posed in your letter dated January 25, 2001, regarding the United States Army Corps of Engineers' ongoing cleanup efforts in the vicinity of Spring Valley, a residential community in Northwest Washington, D.C. I am confident that we will be able to meet your request for a response to all but one question on or before the proposed March 1, 2001 deadline.

Our initial inquiry has indicated that we will need an additional two weeks (*e.g.*, not later than March 14, 2001) to assimilate the necessary financial records from other Federal agencies to answer question 2a regarding the breakdown by agency, FTE, and task, of the annual financial resources expended from FY 1993 to FY 2000 on various aspects of the Spring Valley project.

I fully understand the sensitive nature of this project, and want to convey my commitment to protecting the health and safety of the community. I will dedicate the necessary resources to this end.

The Corps' Baltimore District has a long history of providing outstanding support to both Federal and State customers. I am confident that my team will provide you and your staff the most timely and accurate response possible. Should you have any additional request, please contact me, or have your staff contact Captain Mike Peloquin (410/962-0157) of the Environmental Branch, Programs and Project Management Division.

Sincerely,

Charles J. Fiala, Jr.
Colonel, Corps of Engineers
District Engineer

Colonel Charles J. Fiala, Jr.
Major Brian D. Plaisted
U.S. Army Corps of Engineers, Baltimore District

Prepared Statement before the
DC City Council

Committee on the Judiciary
Committee on Public Works and the Environment
Committee on Human Services

Joint Public Oversight Roundtable

Environmental Health and Safety Issues in Spring Valley/ American University Park Arising from World War I Munitions Experiments

February 14, 2001

Thank you, members of the council, for inviting us to participate in this Roundtable Discussion. The U.S. Army, the Corps of Engineers, and the Corps' Baltimore District are committed to identifying, investigating, and remediating contamination associated with the Formerly Used Defense Site known as American University Experiment Station (AUES) that could adversely impact residents' health and safety. This includes addressing both possible ordnance and explosives, and potential chemical contamination.

In this effort, we are working closely with the District of Columbia Health Department and Region III of the U.S. Environmental Protection Agency (EPA Region III), with whom we have established a solid working relationship. I would like to further assure you that the Army in cooperation with our partners has developed a comprehensive approach for addressing Army-caused contamination in the American University Experiment Station area. (We will refer to this area as "AUES" from here on.) Today, we will describe how we are investigating and remediating the AUES area, beginning with a brief history of what has led up to this plan. At this point I will turn it over to Major Brian Plaisted who has been the on-site operations officer for the last two years.

First, let me describe the Army's activities at AUES between 1917 and 1919. Starting in April 1917 the War Department established a chemical warfare research and testing facility at the American University campus. This testing also included field tests that were conducted on property leased from private residences to the north and west of AUES. Although some mortar firing took place at the site, none of the testing documents show that rounds were fired with chemical warfare agent in them. The tests were to evaluate the ballistic characteristics of the shells and thus they would be loaded with simulated compounds. The actual testing of chemical warfare agent took place at two trench systems, a static test fire area, several other test areas, and three shell pits located near the campus. At the end of the war, the AUES was shut down and the Army evacuated the area within a relatively short time after that. The Army had returned the site to the American University and the property owners by 1921.

I would like to briefly describe the process used to conduct the investigation. Because of the large size of the site (over 660 acres), we needed a logical strategy to identify where we should focus our efforts. Our strategy was to try to identify areas with the greatest potential for contamination, and investigate those areas first. We called these areas "points of interest". The rationale we used, and the one we continue to follow, was that if we found contamination at one of these points of interest, we would then expand our investigation.

In order to identify the points of interest, we conducted a review of the available historical documents. The documents included a large quantity of test reports and archival sources concerning American University Experiment Station. This review was collected into a report called *A Brief History of the American University Experiment Station and the U.S. Navy Bomb Disposal School, American University.*

Another major source of information used to identify points of interest was historical photographs and plans. Aerial photographs from 1918, 1927, and 1937 were analyzed by USEPA's Environmental Photographic Interpretation Center (EPIC). We also had a circa 1918 plan of the AUES campus, and a number of ground photographs of the area.

Based on this review, we identified over 50 points of interest where we would start our investigation. We tried to use the best information available to pinpoint the areas on which to focus our efforts, but as you might understand, this is an inexact science. The most important aerial photograph in terms of locating specific points of interest was probably the one from 1918, since it was taken while AUES was in operation. But the quality of this photograph made it very difficult to locate a particular point in the photo on the ground today. This is not to make excuses, but to try to convey the difficulty of the task we faced, and indeed still face.

In conducting the investigation, we used two primary techniques. We conducted geophysical surveys to identify possible locations for the burial of ordnance material and we conducted environmental sampling to identify possible chemical contamination.

The geophysical surveys were done at all points of interest considered to be potential ordnance burial locations, plus a selection of approximately 10% of all properties outside of the points of interest. These additional properties served as a check on the historical information that had been gathered. A total of 492 properties were surveyed. Most were surveyed with an electromagnetic device called an EM-31. This device is useful in identifying large metallic objects under the ground, such as ordnance burial pits. Some properties had a magnetometer survey due to the difficult terrain or other limiting conditions. A total of over 1900 anomalies were identified. (Anomalies are disturbances in the electromagnetic field that may be indicative of metal objects below the ground surface.) These were reviewed by an unexploded ordnance (UXO) expert against pre-determined study criteria to distinguish potential ordnance from cultural features such as utilities. The UXO expert made recommendations for removal, additional study, or removal from further consideration. 840 anomalies were identified for further investigation or removal. No burial pits were identified. One spent Livens smoke round was identified. Two other rounds were found on the surface and appeared to be amnesty rounds (i.e., items that appear to have been found elsewhere and left by unknown individuals). An additional 3" Stokes mortar round was discovered during the digging of a basement. This round was unfilled, unfired, and unarmed. Approximately 20 other pieces of ordnance scrap items were also found.

Environmental sampling was accomplished at 13 areas. The general process was to take samples from 13 randomly selected locations within each point of interest. The samples were analyzed by an independent laboratory for the contaminants most likely to be found at that point of interest based on the historical documentation. The EPA Region III took samples from these same locations and analyzed them for a full suite of volatile organic compounds (VOCs) semi-volatile organic compounds (semi-VOCs) and metals. A total of 260 samples were taken. Samples were taken as close as possible to the 1918 surface level. Identification of this level was based on a comparison between a 1918 topographic map of the area and a 1981 topographic map of this same area with further identification through field observations. No chemical agents, chemical warfare agent-unique breakdown products, explosives, or explosive breakdown products were found in any of the soil samples collected. The Army conducted a risk assessment for certain metals that exceeded the EPA's risk based screening criteria. This assessment found no elevated health risk requiring remedial action. These findings were documented in a

Remedial Investigation Report. After a public comment period on the Remedial Investigation, the Army issued a No Further Action Record of Decision (NOFA ROD) in June 1995.

Based on the information in the Remedial Investigation Report, we believed we had completed our task. In the Remedial Investigation Report the Army also gave the following assurances: "Consistent with its obligations under CERCLA [Comprehensive Environmental Response, Compensation, and Liability Act] and DERP [Defense Environmental Restoration Program], the Army remains responsible for any additional response actions necessary in relation to buried munitions and environmental contamination associated with prior DoD activities at the OSR FUDS [Operation Safe Removal Formerly Used Defense Sites]. Based on the results of the test and investigations performed to date, the Army concludes that all appropriate and necessary steps have been taken, at this time, to protect public health and safety and the environment in relation to OSR FUDS. If such additional munitions or environmental contamination are discovered at the OSR FUDS, the Army is committed by CERCLA and DERP to take such remedial actions as may be necessary to address such buried munitions and /or environmental contamination resulting from DoD activities."

In 1996, the DC Health Department sent the Baltimore District a letter raising a number of concerns with the previous work at the site. Throughout 1997 the Baltimore District evaluated these concerns, and in January 1998 published a *Remedial Investigation Evaluation Report.* In this review we did identify that we had made an error in the location of one point of interest, Point of Interest 24. It had been mislocated by approximately 150 feet. That may not sound like much in comparison to a 660 acre site, but if the contamination is highly localized, then that's certainly enough to make a difference. We did verify that all the other points of interest were properly located. We felt we needed to conduct additional investigation at the corrected location of this point of interest, and in February 1998 we conducted a geophysical survey of this new location on Glenbrook Road and found two large metallic areas below the ground surface, which were indicative of possible burial pits.

Throughout the remainder of 1998 we developed plans to investigate these two areas and coordinated with the many organizations involved, including the DC Government and a variety of supporting Department of Defense organizations. We mobilized to the site on February 15, 1999 and began the intrusive investigation on March 29, 1999. One year later, on March 29, 2000, we had completed the investigation of two large burial pits. Over 600 items were recovered, including 288 ordnance items. 14 of the items were determined to contain chemical warfare agent, predominantly mustard agent.

As part of this investigation, EPA Region III took samples on the Glenbrook Road property and 4 adjacent properties and analyzed them for a full suite of contaminants. One sample on the Glenbrook Road property was elevated for arsenic. (Please note that arsenic is naturally occurring element that is widely distributed in the environment. Because of this, some arsenic is expected to be found in virtually all soil. This level is sometimes referred to as "background," and that level varies from area to area. To ascertain the background level in this area, EPA Region III, in August 1999, took 30 samples from near Spring Valley, but outside the FUDS boundary. The results from these samples ranged from 3.3 to 18 parts per million.)

Baltimore District then took additional samples and found elevated levels throughout the garden area surrounding the pit excavation. Consistent with our overall approach, grid sampling was then done over the entire property. This was followed by an Engineering Evaluation/Cost Analysis (EE/CA) to determine if there was an elevated risk to health and the appropriate remedial action. After a public comment period, we determined the appropriate remedy to be a two-foot soil removal in those areas with arsenic values that were elevated in comparison to the background distribution of arsenic. After the two-foot removal, confirmation samples are taken and additional soil removed if necessary. Also as a result of the input received during the public comment period, two adjacent properties were included in the removal action. This removal began on December 4, 2000 and is nearing completion on two of the properties on Glenbrook Road.

In January 2000, in light of the contamination we had found on the Glenbrook Road properties, the rationale we had followed all along for investigating this site dictated that we needed to expand the area of investigation. We established Operable Unit 4 (OU-4) and laid out a plan to conduct arsenic sampling on 61 private residences and the southern portion of the American University campus. The area to be sampled was defined to ensure that we included all the area that may have possibly been referred to as "arsenic valley" by the soldiers at the facility as well as the research area of the American University Experiment Station. We coordinated this plan with our partners at DC Health and EPA Region III and then briefed it to the community. The plan included a six-part composite surface sample for each of four quadrants on every property. There was also one subsurface sample location chosen on each property with discrete samples taken every foot to a depth of 6-10 feet depending on the cut or fill since 1918 in that area. The American University property was divided into 28 lots, approximately ½ acre in size, with each lot receiving the same sampling process. For properties larger than two acres we conducted 12-part composite samples and two subsurface borings.

We began sampling in late August 2000 and completed the sampling on November 27 at the AU Child Development Center. Due to its sensitive nature, we expedited the results from the Child Development Center. Those composite results came back elevated at 31.3-parts per million arsenic on December 6, 2000 as compared to the background range of 3.3 to 18 parts per million. We promptly notified the University. We then conducted grid sampling at the CDC on January 4-5 and received those results back on January 17, 2001. We immediately notified the University and the DC Health Department of those results. On January 25th we met with DC Health, EPA Region III, and American University and agreed on a sampling process to determine if there are any other possible contaminants of concern. We have prepared this sampling plan and are awaiting feedback from the University prior to beginning sampling. The Agency for Toxic Substances and Disease Registry collected hair samples from the children on February 1-2, 2001. These samples are currently being analyzed.

On the residential properties, we were able to sample 42 of the 61 properties we had initially identified. Eleven property owners would not give us permission to do the sampling and we were unable to make contact with 8 other property owners. After obtaining the composite results for these 42 properties, we identified eight private residences where the sample results exceeded 13 parts per million. This value represents upper range of the background distribution of samples. In coordination with EPA Region III and DC Health we agreed on a sampling plan

to conduct 20-foot grid sampling on these eight properties plus one other nearby property. Six of the nine properties are on Rockwood Parkway with single properties on Indian Lane, Quebec Street, and Woodway Lane. On four properties we also took samples to determine if there are other possible contaminants of concern. This sampling began on February 1st and is expected to be complete later this week. We will then use this data to conduct a risk assessment and feasibility study to determine the appropriate response action.

We have also conducted 6-part composite sampling on 11 other properties as part of our effort to ensure that we have fully characterized the OU-4 sampling area. Five properties were added that were adjacent to properties that had elevated surface sample results. Of the other six properties, two were properties that we had been unable to contact previously, two were properties where the owners had only allowed subsurface sampling previously, and two were properties near OU-4 that had special circumstances warranting investigation.

The OU-4 sample results also showed six lots at AU with surface sample results above 13 PPM. At our January 25th partnering meeting, we agreed to conduct 20-foot grid sampling over this area. We will also do this sampling over a portion of the area that EPA Region III had sampled in 1999 that had some elevated results. Finally, we will conduct subsurface sampling at several locations on American University near Nebraska Avenue that had slightly elevated subsurface sample results as well as one area near the Glenbrook Road properties.

Concurrently with these efforts, EPIC has reviewed the archives and found several additional aerial photographs of the area, including one from 1922 and one from 1928. The team has given EPIC a list of priority areas for review. These areas (in priority) were the OU-4 area, the Sedgwick trench area, the 52nd Court trench area, the Static Test Fire area, and a review of the entire area using the new photographs. EPIC has completed this review for the OU-4 area and the Sedgwick Trench area and is now reviewing the 52nd Court trench area. The review in the OU-4 area guided our sampling effort there and also has contributed to our decision to conduct test pits at one of the Glenbrook Road properties to locate a possible ceramic/glassware burial pit. The review of the Sedgwick trench area has led the team to agree on a sampling process for the five properties directly over the trenches and two other properties nearby where ground scars appear on several photographs. We also identified one area for sampling and geophysical survey work. Finally, we agreed to review the geophysical survey data of these properties that was collected in 1993. We expect the sampling and review to be completed in April.

One final area to mention is the "small disposal area" located on American University. This was a surface disposal area containing laboratory glassware and metal items. The area was investigated from January 8-11, 2001 under evacuation conditions. No chemical warfare material was identified there, though elevated levels of lead and arsenic were detected. Confirmation samples at the base of the excavation still have elevated levels of lead and arsenic. This area of native soil will be further excavated to remove these contaminants. In addition, the sediment in the stream that begins in this area will be removed down to where the stream crosses Glenbrook Road. Samples taken by EPA Region III in December 1999 show no elevated levels of arsenic in the sediment downstream from this point.

In conclusion, this is an extremely complex project with several significant issues. There are no easy solutions. The science involved locating old burial locations and determining contents is difficult to understand and is not always able to provide clear cut, definitive answers. The historical documentation is extensive, however, it is insufficient to provide a complete picture of everything that occurred at the site. In coordination with our partners and the community we must make sound judgments to make best use of the resources that we use to identify, investigate, and remediate any contamination at the site. Most of our current work in Spring Valley is a result of revisiting the location of Point of Interest 24, and I think its safe to say that if we had looked in the correct location for Point of Interest 24 during our initial investigation from 1993 to 1995, we would have discovered at that time the elevated arsenic levels that we are now finding.

I also want to assure you that we have and will continue to be open and transparent with the community. We have conducted regular community meetings that are open to the public and continue hold these meetings. We also send out a periodic newsletter to the entire community with updates on project activities. We established and publicized a website with information on the project as well as a toll free phone information line. We have also held public availability sessions to address key topics. Finally, my staff has made themselves available to answer residents' questions and will continue to do that in the future.

Finally I wanted to reiterate that the Army is committed to identifying, investigating, and remediating contamination associated with the Formerly Used Defense Site known as American University Experiment Station (AUES) that could adversely impact residents' health and safety. We are committed to working with the community as has been demonstrated in our responsiveness to the concerns from the parents at the American University Child Development Center concerning our sampling efforts.

Website address: http://www.nab.usace.army.mil/projects/WashingtonDC/springvalley.htm

Question 1: What is the full inventory of hazardous materials, including munitions and contaminants, now being addressed at the Spring Valley site?

1. There are several inventories of hazardous materials potentially present at the Spring Valley site. The most comprehensive of these is drawn from 1918 American University Experiment Station (AUES) records (Attachment 4.1). It includes all chemical and toxic agents, smoke, incendiary, and detonator materials investigated at AUES.

In 1993, our contractor, Parsons Engineering Science, Inc. (then known as Engineering-Science, Inc.) refined the original list to identify potential contaminants in the Spring Valley Remedial Investigation This document, which is included in many of the 1993 –1995 reports, is particularly useful in that it characterizes potential contaminants as Chemical Warfare Material (CWM), Ordnance and Explosive Waste (OEW), Agent Breakdown Products (ABP), Explosive Breakdown Products (EBP), and Agent Precursors. This document is included as Attachment 4.2.

The primary contaminants of concern have been mustard agent and lewisite. Mustard agent is a sulfur-based compound that acts as a vesicant or blister agent. The historical record indicates mustard agent was loaded in ordnance for testing at AUES. These munitions were then detonated statically (not ballistically fired – *i.e.*, shot out of a mortar tube) to measure the effects of the agent on live test animals tied to stakes in the vicinity. Although mustard agents hydrolyze in the presence of moisture, they may exist for extended periods in a polymerized form.

Lewisite, a compound similar to mustard but based on arsenic rather than sulfur, was developed at AUES; however, it is not believed to have been loaded into ordnance. Lewisite also breaks down in the presence of moisture, resulting in chlorovinylarsenious acid (CVAA) and chlorovinylarsonic acid (CVOAO). While sampling was initially done for lewisite, CVAA, and CVOAO, arsenic is the more persistent and readily analyzed indicator for lewisite.

Phosgene was also loaded into munitions and tested at AUES. However, because it is a gas at temperatures above 46 degrees Fahrenheit, it would not remain as a soil contaminant.

Our current environmental sampling efforts include several different testing regimens (this methodology is fully explained in the response to Question 3). Our sampling plans are developed in cooperation with both the Environmental Protection Agency Region III (EPA) and the District of Columbia Department of Health, Environmental Health Administration (DCEHA).

Munitions that have been addressed in the Spring Valley site include: 3 inch and 4 inch Stokes mortar rounds, Livens projectors, 4.7 inch steel shank MK II gas projectiles, and 75mm projectiles.

Question 1a: Please provide a full listing of the inventory.

1a. See Attachment 4.1.

Question 1b: What additional materials are suspected, if any?

1b. No additional chemical materials are suspected. The "Brief History of the American University Experimental Station ..." document indicates that AUES researchers designed and tested incendiary and smoke grenades, incendiary bombs, incendiary artillery shells, incendiary darts, and incendiary Livens gun projectiles (pp. 26-27). We have not found any of these items to date; however, they should still be considered potential ordnance materials.

Question 1c: What are the likely origins of known and suspected materials, including munitions and contaminants, in the Spring Valley vicinity (for instance, research labs, testing pits)?

1c. Contaminant sources in Spring Valley can be divided into three categories: the result of direct AUES research, the result of AUES disposal, and the result of other, undifferentiated sources. AUES conducted direct testing of both munitions and agents on the property, and we have found materials directly attributable to these activities. There is also evidence suggesting that an unknown amount of lab materials and chemicals were disposed of by burying them in locations on the AUES grounds. Finally, there have been indications that some materials found to date have come from activities that occurred on the property since the AUES was shut down and the property turned back to AU and local landowners in 1921.

Researchers at AUES conducted both ballistics and chemical testing with ordnance items. This testing seems to have occurred in specific locations, some designated for static firing to test the effects on chemical agents and some designated for testing the ballistic characteristics of several mortar-type rounds. The historical documents suggest that these areas were separate and that chemical agents were never used in munitions that were ballisticly fired.

AUES research on chemical agents provides another possible source of contamination in Spring Valley. We can attribute specific agents and agent-specific breakdown products to these testing and development activities. This would include any of the Chemical Warfare Materials (CWM) listed on Attachment 4.2 plus many of the ABPs (e.g., CVAA, CVOAO, dithiane, and oxithiane). However, many of the chemicals used at AUES, and even some of the ABPs, have other possible sources (as discussed below) that may have contributed to the contamination in Spring Valley.

A second means of soil contamination was through the disposal of the materials used by AUES researchers. References in historical documents and anecdotal references on old photos led us to believe that an unknown amount of research equipment and chemicals may have been disposed of by burying them. Unfortunately, there are no records of these locations. Relying on the records we do have and the aerial photographic analysis conducted by EPA's Environmental Photographic Interpretation Center (EPIC), we identified and have been investigating potential burial areas. To date we have unearthed three large-scale burials. The first, located in the vicinity of 52nd Court, contained 141 intact munitions, assorted ordnance related debris, and laboratory material. The other two, located on the Korean ambassador's residential property on Glenbrook Road, contained over 600 items, including 288 ordnance items.

We are currently completing the remediation of another disposal area. This site, referred to as the "small disposal area" is located on the edge of American University. Our excavation of the area found only laboratory glassware and non-ordnance related metal debris, but did not find ordnance materials. Soil sampling results in this area indicated elevated levels of lead and arsenic in the burial area. Analysis of the area is ongoing. Archeological evaluation of the materials indicates the possibility that these materials date from after AUES had left the site. This suggests a third potential source of contamination in Spring Valley – that from non-AUES sources.

Unfortunately, many of the chemicals that might have been used at AUES are also commonly found in university research labs and even household products. For example, arsenic, in addition to being a potential indicator of lewisite, has been a component in commonly used herbicides, insecticides, and lawn care products. It has been shown to accumulate to high levels as a result of their repeated application. Thiodiglycol (TDG), an agent breakdown products (ABP) of mustard, is also used in antifreeze, in the production of polyvinyl chloride (PVC), and in the ink used in ballpoint pens. In testing last fall, we actually had two sample locations on American University that showed TDG levels. But since we saw neither dithiane nor oxithiane, two other mustard ABPs, we attribute the TDG to non-AUES sources. While we may never be able to ascertain the true source of all contaminants found in Spring Valley, it is clear many potential sources of contamination exist beyond AUES.

Attachment 4.1

27 January 1993

MEMORANDUM FOR RECORD

SUBJECT: Chemical Agents, Toxins, Smoke, Incendiary, and Detonator Materials Investigated at American University Experiment Station During World War I

1. Reference: Augustin M. Patterson and Clarence J. West, "A Chemical Warfare Glossary," (Monograph No. 16), American University Experiment Station, Washington, D.C., 27 Sep 18.

2. According to Reference 1, the following chemical and toxin agents were investigated at American University Experiment Station during World War I:

Code	Name
G-4	Acrolein (Papite)
G-7	Arsine (Yellow Star)
G-10	Arsenic Trichloride (BR, Marsite)
G-13	Bromoacetone (BA)
G-16	Xylyl Bromide
G-19	Chloroform
G-22	Choroacetone (Tonite)
G-25	Chloropicrin (S-1, PS, Aquinite)
G-28	Chlorine (S-10, Red Star, Berthollite)
G-31	Carbon Monoxide
G-34	Mustard Gas (MO, HS, Yperite)
G-37	Methyl Sulfate
G-40	Ethyl Iodoacetate (SK, KSK)
G-43	Hydrocyanic Acid (AC, Forestite)
G-46	Chloromethyl Chloroformate (Cipalite, Palite)
G-49	Trichloromethyl Chloroformate (SF, Surpalite, Superpalite, Pallite)
G-52	Phosgene (L-3, CG, Coliongite)
G-55	Perchloromethylmercaptan
G-58	Benzyl Chloride
G-61	Ethyl Bromoacetate (US)
G-64	Ethyl Dibromoacetate
G-67	Cyanogen Bromide (CB)
G-70	Bromketone (G-136)
G-73	Phenylcarbylamine Chloride
G-76	Diphenylchloroarsine (DA)
G-79	Ethyl Chloroformate
G-82	Isoallylamine
G-85	Ricin
G-88	Diiodoacetylene
G-91	Oxalyl Chloride
G-94	Bromoacetyl Bromide
G-97	Methylnitrosourethan

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G-100	Thiophosgene (TP)
G-103	Dichloropropyl Sulfide
G-106	Acetyl Fluoride
G-109	Chloroacetyl Fluoride
G-112	Chloroacetic Anhydride
G-115	Methyl Selenide
G-118	Cacodyl Chloride
G-121	Cacodyl Bromide
G-124	Phenyl Isocyanide
G-127	Methyl Isocyanide
G-130	Tolyl Isocyanides (mixed)
G-133	Titanium Tetrachloride:Cyanogen Chloride
G-136	Bromketone (G-70)
G-139	Arsenic Trifluoride
G-142	Trichloroacetyl Cyanide
G-145	Nickel Carbonyl
G-148	Sulfur Trioxide (S-97)
G-151	Methyl Chlorosulfonate
G-154	Bromoacetone, Chloroacetone (BC, Martonite)
G-157	Diazomethane
G-160	Allyl Isocyanide
G-163	Chlorinated Carbon Disulfide
G-166	Trichloroacetonitrile
G-169	Benzoyl Fluoride
G-172	Benzyl Bromide (Cyclite, Lachrymogene)
G-175	Bromomethyl Ether
G-178	Cyanogen Chloride (CC, Mauguinite)
G-181	Arsenic Trioxide (S-88)
G-184	Sodium Cyanide (S-91)
G-190	Methyl Chloroformate
G-193	Chloroacetonitrile
G-196	Chlorinated Acetone and Turpentine
G-199	Hydrofluoric Acid
G-202	Chloromethyl Ether
G-205	Acetyl Cyanide
G-211	Cacodyl Cyanide
G-214	Ethyl Isothiocyanate
G-220	Allyl Isothiocyanate
G-226	Methyl Bromoacetate
G-229	Allyl Alcohol
G-232	Ethyl Isocyanide
G-235	Dichloromethyl Ether
G-238	Trichlorohydrin
G-241	Benzyl Iodide
G-244	Dichloromethyl Sulfide
G-247	Tetrachloromethyl Sulfide
G-250	Thiophene

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G-253	Acetonitrile
G-256	Hydrogen Selenide
G-259	Chloromethyl Ethyl Ether
G-262	Aluminium Selenide
G-265	Dimethylarsine
G-268	Cacodyl
G-271	Phenyl Isothiocyanate
G-274	Phenylhydrazine
G-280	Benzotrichloride
G-283	Ethyl Trichloroacetate
G-286	Chlorobenzene
G-289	Chromyl Chloride (I-55, MG)
G-292	Ethyl Sulfide
G-295	Bromobenzene
G-298	Trichloroacetyl Chloride
G-301	Phenyl Isocyanate
G-307	Crotonaldehyde
G-310	o-Chloronitrobenzene
G-313	Methyldichloroarsine (G-358)
G-316	o-Tolyl Isocyanide
G-319	Ethyldichloroarsine (CY)
G-322	Adamsite (DM)
G-325	Methyl Chloroacetate
G-328	Acetyl Thiocyanate
G-334	Cadmium Methyl
G-337	Bromobenzyl Cyanide (CA, Camite)
G-340	Chlorodiethyl Sulfide
G-343	Bromxylyl Cyanide
G-346	Kendallite
G-349	Phenyldichloroarsine (MA)
G-352	Allylamine
G-355	Dichloroethyl Disulfide
G-358	Methyldichloroarsine (G-313)

3. According to Reference 1, the following smoke materials were investigated at American University Experiment Station during World War I:

Code	Name
S-4	Ammonia
S-7	Ammonium Chloride (I-118)
S-10	Chlorine (G-28, Red Star, Berthollite)
S-13	Hydrochloric Acid
S-16	Oil Smoke
S-19	Phosphorus
S-22	Silicon Tetrachloride

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S-25	Stannic Chloride (Tin Tetrachloride)
S-28	Titanium Tetrachloride (FM, Fumigerite)
S-31	Zinc Chloride mixture
S-34	Sodium Chlorate (I-130)
S-37	Sulfur Chloride
S-40	Sulfuryl Chloride
S-43	Carborundum (SC)
S-46	Silicon
S-49	Zinc
S-52	Iron (L-19)
S-55	Aluminium (I-88)
S-58	Carbon Tetrachloride (I-97, L-16)
S-61	Halo Wax
S-64	Hexachloroethane (HC)
S-67	Sodium Nitrate (I-13)
S-70	Potassium Chlorate (I-67, L-10)
S-73	Potassium Nitrate (I-70)
S-76	Potassium Permanganate (A-16)
S-79	Sulfur (I-160)
S-82	Kieselguhr (A-43, I-124, L-22)
S-85	Zinc Oxide (I-121)
S-88	Arsenic Trioxide (G-181)
S-91	Sodium Cyanide (G-184)
S-94	Sodium Bicarbonate
S-97	Sulfur Trioxide (G-148)

4. According to Reference 1, the following incendiary materials were investigated at American University Experiment Station during World War I:

Code	Name
I-4	Carbon Disulfide (Essence)
I-7	Flash mixture
I-13	Sodium Nitrate (S-67)
I-16	Thermite
I-19	Turpentine
I-22	Thermite Igniter
I-25	Phosphorus, White (WP, Fumite)
I-28	Phosphorus, Red (RP)
I-31	Potassium Chlorate and Aluminium (Ophorite)
I-43	Back Powder
I-45	Adamsite (DM)
I-49	Waste
I-52	Sodium Silicate (A-31)
I-55	Chromyl Chloride (G-289, MG)
I-58	Rosin, Turpentine

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I-61	Barium Peroxide
I-64	Magnesium
I-67	Potassium Chlorate (L-10, S-70)
I-70	Potassium Nitrate (S-73)
I-73	Potassium Perchlorate
I-76	Lead Peroxide
I-79	Paraffin
I-82	Aluminium-CCl_4-$NaClO_3$
I-85	Trinitrotoluene
I-88	Aluminium (S-55)
I-91	Sodium Stearate
I-94	Sodium Oleate
I-97	Carbon Tetrachloride (L-16, S-58)
I-100	Soap
I-103	Oleic Acid
I-106	Stearic Acid
I-109	Sodium Hydroxide (A-28)
I-112	Ammonia Gas
I-115	Zinc Powder
I-118	Ammonium Chloride (S-7)
I-121	Zinc Oxide (S-85)
I-124	Kieselguhr (A-43, L-22, S-82)
I-127	Sawdust
I-130	Sodium Chlorate (L-7, S-34)
I-133	Wood Flour
I-136	Magnesium Carbonate
I-139	Calcium Sulfate
I-142	Calcium Carbonate
I-145	Limestone (ground)
I-148	Ammonium Nitrate
I-151	Magnesium Oxide and Limestone
I-154	Stannic Chloride, Anhydrous (KJ, Opacite)
I-157	Sodium (metallic)
I-160	Sulfur (S-79)
I-163	Bromine
I-193	Celluloid
I-199	Alcohol

5. According to Reference 1, the following detonator materials were investigated at American University Experiment Station during World War I:

Code	Name
D-4	Lead Thiocyanate
D-7	Trinitrotoluene (I-85)
D-10	Lead Ferrocyanide

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D-13	Cyanogen
D-16	Sodium Cyanide (G-184, S-91)
D-19	Ammonium Cyanide
D-22	Ammonium Picrate
D-25	Arsenic Trioxide (G-181, S-88)
D-28	Parazol
D-31	Chlorine (G-28, S-10, Red Star, Berthollite)

6. The POC for this memorandum is the undersigned at (410) 671-4430 or DSN 584-4430.

JEFFERY K. SMART
Historian
Historical Division
Corporate Information Office
Chemical Biological Defense Agency

[redacted]

[redacted]

TOXIC ANILITE

RO-17

Anilite is a new explosive composed of mixture of a nitrobenzol and liquid nitrogen peroxide. It is far more powerful than T.N.T. and considerably less expensive to manufacture. Its sensitivity to shock may be varied at will by varying the proportions of the constituents, though, of course, a loss in efficiency results as the proportions depart from those of the theoretical mixture. It has been suggested that by the addition of carbon tetrachloride it would be possible to obtain a phosgene content of 91% of the gases resulting from the explosion, thus combining the effect of a toxic gas and a high explosive in one shell. Upon actual test 40% of the gases resulting from the explosion were found to be phosgene, while the explosive effect was equal if not superior to that produced by an equal quantity of T.N.T. However, since the toxic anilite is less powerful than pure anilite and since the powerful detonation would too greatly disperse the phosgene resulting from the explosion to establish an effective concentration, it was thought advisable to use high explosives and toxic materials in separate shell especially adapted to the specific material. No further work has therefore been carried out on this project.

[redacted]

Attachment 4.2

TABLE 3-1

POTENTIAL CONTAMINANTS
SPRING VALLEY REMEDIAL INVESTIGATION

CWM	ABP
Arsenic Species	
Lewisite (L)	Hydrogen chloride, chlorvinylarsenious acid (CVAA)
Adamsite (DM)	Hydrogen chloride, diphenylarsenious acid
Sulphur Mustards	
Levinstein Mustard (H)	Thiodiglycol, dithiane, oxathiane
Distilled Mustard (HD)	Thiodiglycol, dithiane, oxathiane
Cyanide Species	
Total Cyanide	Total cyanide
Hydrogen Cyanide (AC)	Hydrogen cyanide
Cyanogen Chloride (CK)	Cyanogen chloride
Cyanogen Bromide (CB)	Cyanogen bromide
Tearing Agents	
Chloroacetophenone (CN)	Hydroxyacetophenone
Chloropicrin (PS)	

OEW	EBP
Tetryl	
TNT	2,4 dinitrotoluene, 2,6 dinitrotoluene
Nitroglycerin	Nitrobenzene, chlorobenzene

Agent Precursors

Acrolein	Methylnitrosourethane	Bromomethyl Ether
Arsine	Thiophosgene	Arsenic Trioxide
Arsenic Trichloride	Dichloropropyl Sulfide	Sodium Cyanide
Bromoacetone	Acetyl Fluoride	Methyl Chloroformate
Xylyl Bromide	Chloroacetyl Fluoride	Chloroacetonitrile
Chloroform	Chloroacetic Anhydride	Chlorinated Acetone and Turpentine
Choroacetone	Methyl Selenide	Hydrofluoric Acid
Chloropicrin	Cacodyl Chloride	Chloromethyl Ether
Carbon Monoxide	Cacodyl Bromide	Acetyl Cyanide
Methyl Sulfate	Phenyl Isocyanide	Cacodyl Cyanide
Ethyl Iodoacetate	Methyl Isocyanide	Ethyl Isothiocyanate
Hydrocyanic Acid	Tolyl Isocyanides (mixed)	Allyl Isothiocyanate
Chloromethyl Chloroformate	Titanium Tetrachloride	Methyl Bromoacetate
Trichloromethyl Chloroformate	Bromoketone	Allyl Alcohol
Perchloromethylmercaptan	Arsenic Trifluoride	Ethyl Isocyanide
Benzyl Chloride	Trichloroacetyl Cyanide	Dichloromethyl Ether
Ethyl Bromoacetate	Nickel Carbonyl	Trichlorohydrin (SIC)
Bromoketone	Sulfur Trioxide	Benzyl Iodide Sulfide
Phenylcarbylamine Chloride	Methyl Chlorosulfonate	Dichloromethyl Sulfide
Ethyl Chloroformate	Bromoacetone, Chloroacetone	Tetrachloromethyl Sulfide
Isoallylamine	Diazomethane	Thiophene
Ricin	Allyl Isocyanide	
Diiodoacetylene	Chlorinated Carbon Disulfide	
Oxalyl Chloride	Trichloroacetonitrile	
Bromoacetyl Bromide	Benzoyl Fluoride	
	Benzyl Bromide	

Question 2: What financial resources, including both federal and local, are budgeted for FY 2001 to investigate, remediate, oversee, assess, and conduct removals in the vicinity of the Spring Valley site?

Attachment 5.1 shows the Corps of Engineers' current FY 2001 budget to investigate, remediate, oversee, assess, and conduct removals, in the vicinity of the Spring Valley site. The source is entirely federal; we receive no local funding to support our activities in Spring Valley.

Note that the current total budget of $6.06 million reflects a $2.8 million increase from the original budgeted amount. Additionally, we have received word that this project has been approved for another $4 million increase not yet reflected in the attached budget.

We have contacted applicable federal and local agencies and requested their FY 01 expenditures for Spring Valley. If received, they will be submitted with our subsequent response.

Question 2a: Please provide a breakdown, by agency, FTE, and task, of the annual financial resources expended from FY 93-00 to investigate, remediate, oversee, assess, and conduct removals at the Spring Valley site?

Per prior correspondence, this inquiry will be addressed in a separate response no later than March 14, 2001. This report will include Corps payments to other federal and local agencies for their participation in the project.

We have contacted applicable federal and local agencies and requested their FY 93-00 expenditures for Spring Valley. If received, they will be submitted with our subsequent response.

FORMERLY [redacted]ED DEFENSE SITES
ANNUAL W[redacted]PLAN FOR NAB
FY 2001 Report Downloaded from F 14-Feb-01

OCE	PROP No.	Prop Name	PEAR Code	Proj Cat	Phase	Exec FOA	RR/ RAC	2001 Plan IH	2001 Plan C	1st Qtr IH	1st Qtr C	2nd Qtr IH	2nd Qtr C	3rd Qtr IH	3rd Qtr C	4th Qtr IH	4th Qtr C
		TOTAL PROJECTS															
26	C03DC0918	SPRING VALLEY	2FWQDC091801	OEW/CWM	EE/CA	NAB	/1	923.2	1410.1	165.4	735.5	233	374.6	268	300	256.8	
26	C03DC0918	SPRING VALLEY	2FWQDC091801	OEW/CWM	EE/CA	HNC	/1	401.4	225	84.9		105.5	200	105.5	25	105.5	
26	C03DC0918	SPRING VALLEY	2FWEDC091801	OEW/CWM	RA-C	NAB	/1	104.4	340	84.4	90	20	250				
24	C03DC0918	SPRING VALLEY	2FHIDC091802	HTRW	IRA	NAB	NE/		400				200		200		
26	C03DC0918	SPRING VALLEY	2FHRDC091802	HTRW	RI/FS	NAB	NE/	201.8	577.5	20.8	27.5	57	550	62		62	
22	C03DC0918	SPRING VALLEY	2FHRDC091804	HTRW	RI/FS	NAB	NE/	80	290.6		140.6	30	50	25	100	25	
22	C03DC0918	SPRING VALLEY	2FOQDC091805	OEW/CWM	EE/CA	HNC		80	971.1			80			971.1		
22	C03DC0918	SPRING VALLEY	2FWQDC091806	OEW/CWM	EE/CA	NAB		5						5			
22	C03DC0918	SPRING VALLEY	2FWQDC091806	OEW/CWM	EE/CA	HNC			50						50		
		TOTAL DC						**1795.8**	**4264.3**	**6060.1**							
22	C03DE0064	DELAWARE TARGET AREAS	2FOIDE006403	OEW	IRA	NAB	/1	5				5					
22	C03DE0064	DELAWARE TARGET AREAS	2FOIDE006403	OEW	IRA	HNC	/1	2				2					
22	C03DE0908	DRAVO CORPORATION	2FPGDE090802	PRP/HTRW	PN	NAB		2				2					
		TOTAL DE						**9**		**9**							
22	C03MD0201	NATL DEF STOR DEPOT CURTIS BAY	2FPGMD020102	PRP/HTRW	PN	NAB		14				14					
25	C03MD0237	NIKE BA-30/31 (TOLCHESTER)	2FHCMD023701	HTRW	LTM	NAB	L/	30		10		5		5		10	
22	C03MD0237	NIKE BA-30/31 (TOLCHESTER)	2FCEMD023703	CON/HTRW	RA-C	NAB		50		40		10					
22	C03MD0238	NIKE W-36 (CROOM)	2FPSMD023803	PRP/HTRW	SI	NAB		15		15							
		TOTAL MD						**109**		**109**							
22	C03PA0859	AIR FORCE PLANT 45	2FHSPA085902	HTRW	SI	NAB	NE/	20		5		10		5			
22	C03PA1057	CLAYSBURG AIR FORCE STATION	2FCEPA105701	CON/HTRW	RA-C	NAB		15	30	15	30						
22	C03PA1015	CONNELLSVILLE AIRPORT	2FHSPA101503	HTRW	SI	NAB	NE/	65		55		10					
30	C03PA0042	FRANKFORD ARSENAL	2FHSPA004204	HTRW	SI	NAB	NE/	50		30		10		5		5	
22	C03PA0042	FRANKFORD ARSENAL	2FHSPA004205	HTRW	SI	NAB	NE/	100	100	20		40	100	25		15	
26	C03PA0042	FRANKFORD ARSENAL	2FWSPA004203	OEW/CWM	SI	NAB	/1	20		5		5		5		5	
26	C03PA0042	FRANKFORD ARSENAL	2FWSPA004203	OEW/CWM	SI	HNC	/1	40	70	5		10		20	70	5	
30	C03PA0043	KEYSTONE ORDNANCE WORKS	2FHSPA004303	HTRW	SI	NAB	NE/	81.1		10		20		30		21.1	
22	C03PA0479	MARINE CORPS TRAINING CENTER	2FHSPA047902	HTRW	SI	NAB	NE/	5		5							
22	C03PA0403	NEW CUMBERLAND ARMY DEPOT	2FHEPA040301	HTRW	RA-C	NAB	H/	205		130		25		25		25	
22	C03PA0228	NIKE PH-15 (BRISTOL)	2FDEPA022802	BD/DR	RA-C	NAB		16	70	10	70	6					
22	C03PA0228	NIKE PH-15 (BRISTOL)	2FHSPA022801	HTRW	SI	NAB	L/	110		50		30		30			
22	C03PA0230	NIKE PH-75/78 (MEDIA)	2FCEPA023002	CON/HTRW	RA-C	NAB		15		15							
31	C03PA0230	NIKE PH-75/78 (MEDIA)	2FHRPA023003	HTRW	RI/FS	NAB	M/	90		10		50		30			
22	C03PA1047	NIKE PI-42 (ELIZABETH TWP)	2FCEPA104702	CON/HTRW	RA-C	NAB		40	168			20	170	20			
22	C03PA1047	NIKE PI-42 (ELIZABETH TWP)	2FCDPA104702	CON/HTRW	RD	NAB		16		16							
22	C03PA1046	NIKE PI-52 (FINLEYVILLE)	2FCEPA104601	CON/HTRW	RA-C	NAB		40	125			20	125	20			
22	C03PA1046	NIKE PI-52 (FINLEYVILLE)	2FCDPA104601	CON/HTRW	RD	NAB		4		4							
22	C03PA0861	OLMSTED AFB	2FHSPA086105	HTRW	SI	NAB	NE/	80	100	20		30	100	20		10	
22	C03PA0441	VALLEY FORGE GENERAL HOSPITAL	2FCEPA044106	CON/HTRW	RA-C	NAB		25	40	5	40	10		10			
22	C03PA0441	VALLEY FORGE GENERAL HOSPITAL	2FCDPA044106	CON/HTRW	RD	NAB		10		10							
25	C03PA0441	VALLEY FORGE GENERAL HOSPITAL	2FHCPA044102	HTRW	LTM	NAB	H/	97	35	32	35	20		20		25	
		TOTAL PA						**1144.1**	**738**	**1882.1**							
		FUDS M&S						**150**		37.5		37.5		37.5		37.5	
		DC						6060.1									
		DE						9									
		MD						109									
		PA						1882.1									
		M&S						150									
		TOTAL						**8210.2**									

	ORIGINAL	PLUS-UP	NEW POM
FUNDED POM AMOUNT:	**5410.2**	**2800**	**8210.2**

Attachment 5.1

Question 3: What tests and techniques are currently used to define the full scope of the hazardous materials, munitions and other contamination existing at the Spring Valley site?

3. We currently employ a deliberate and systematic approach for defining the full scope of the hazardous materials, munitions, and other contamination existing at the Spring Valley site. It is based on our commitment to address the concerns of the project's stakeholders – EPA, DCEHA, and the community itself – married with the application of sound investigative principles.

There are two distinctive aspects to our investigation in Spring Valley: unexploded ordnance (UXO), and chemical contamination. As summarized in the *Remedial Investigation Evaluation Report* (Jan 98) (hereinafter referred to as the RI Evaluation), the Corps' investigative approach is to "investigate those areas of highest probability of hazards and expand the area of investigation only if hazards were detected in these high probability areas," (p.1-3, paragraph 1.2.2.2). These areas, referred to as Points of Interest (POIs), were identified from historical records and EPIC's analysis of aerial photographs. They include areas of known and suspected testing, plus areas that suggest burial pits. EPIC has found additional aerial photos, and is currently analyzing them to identify any new POIs. This analysis has not yet identified new POIs, but has guided our investigation in the Sedgwick trench area and prompted plans to dig test pits on 4825 Glenbrook Road to locate a possible ceramic/glassware burial pit.

Additionally, during the 1993-1995 investigation, 10 percent of the geophysical surveys conducted were "spot checks" on areas for which the archival records did not suggest a potential hazard. Failure to find any large caches of munitions in these areas lends support to our hypothesis that caches would be associated with identified POIs. Additional defense of this approach is located in sections 5.2 and 7.2 in the RI Evaluation.

Our tests and techniques used to find UXO have focused on finding large quantities of metallic objects such as cylinders buried in pits or trenches identified as POIs. Early work used the geophysical instruments described in section 7.3 of the RI Evaluation. While we have included newer technology in more recent geophysical surveys, this equipment has only confirmed previous findings (see section 1 of the *Geophysical Investigation Report, 4801 Glenbrook Road, Spring Valley Operable Unit 3, Washington, D.C.*, May 1999). And while some equipment is better suited to identify smaller, specific items, current technology is unable to differentiate between ordnance, scrap metal, or iron-rich rock.

Section 7.5 of the RI Evaluation provides an excellent synopsis of the Anomaly Review Process. This technique incorporates several levels of checks and balances in the identification and final disposition of potential buried ordnance.

The overall strategy for our search for chemical contamination is based on the same principles as those discussed above for unexploded ordnance. We also rely on the results from our previous investigations to improve ongoing and future sampling plans. These sampling plan changes are developed in cooperation with the EPA and DCEHA at our monthly partnering meetings.

To date, the results from our own and the EPA's sampling throughout Spring Valley have consistently identified arsenic in soil as a primary AUES contaminant that should be addressed. This is based on the fact that no soil or water sampling to date has found any of the agents or agent breakdown products other than arsenic. Given this, we typically sample for arsenic as an indicator. However, in locations where records indicate AUES activities that could generate specific chemical contaminants (*e.g.*, around AUES labs and suspected burial pits) we conduct site-specific testing for these contaminants. In recent Operational Unit 4 (OU-4) testing, in response to resident concerns about contaminants other than arsenic, we tested for the complete list of potential contaminants (Attachment 4.1). This was done to soothe rising community concerns about other potential chemical contaminants. We completed this sampling last week, and we expect the results by the end of April.

As our testimony to the D.C. City Council relates (see Attachment 3), our EPA-approved investigation methodology relies on composite surface and discrete subsurface sampling of suspected properties. This sampling strategy was developed in cooperation with the EPA and DCEHA, and with community approval. It includes taking one six-part composite surface sample from each quadrant of the property (most properties were divided into four quadrants for sampling purposes). We also take discrete subsurface samples from one location on each property. This provides a sample from every foot to a depth of 6 to 10 feet.

This sampling methodology is based on the EPA's Soil Screening Level Guidance (EPA, 1996). Whenever these samples show elevated arsenic levels, we then employ a more rigorous grid sampling procedure on each quadrant showing elevated arsenic levels. Additionally, when grid sampling finds elevated arsenic levels near a property border, we then conduct additional sampling on the adjacent property to identify the limits of the contamination.

The above-described approach has been used successfully to identify contamination at the American University Child Development Center and our current sampling of 42 other private residences that records suggested might have been on or near an AUES testing area. In every case, results from the initial composite sampling are discussed with our partners at EPA and DCEHA to develop a consensus plan for further sampling. This plan is then presented at the subsequent community meeting to solicit residents' input and approval prior to execution. This sampling approach, starting with arsenic sampling at specific points of interest, and expanding in response to findings of elevated arsenic, continues to provide a cost-effective methodology for defining the full scope of the potential contamination in Spring Valley.

Testing procedures used to identify specific contaminants in the soil samples taken are indicated in Attachment 6.1.

Question 4: What is currently known about the potential short-term as well as long-term health risks (if any) to the residents of the Spring Valley neighborhood as well as the American University community?

4. As our contaminant investigations to date have only found elevated arsenic levels, any discussion of the current potential short- and long-term health risks to the Spring Valley residents and American University community relate to arsenic toxicity. We provide arsenic toxicity information to the community via links from our Web site to the ATSDR Web site (see Attachment 7.1) and from an arsenic information sheet we've sent to many residents (see Attachment 16.1).

We recently requested support from the Army's Center for Health Promotion and Preventative Medicine (CHPPM) to help us better address the potential health risks associated with arsenic. CHPPM has provided summary input regarding arsenic toxicity and contributed to the following discussion of potential health risks.

Historical records and our sampling results to date do not suggest widespread health risks in the Spring Valley community due to AUES activities. There is concern that pockets of elevated arsenic pose potential risk, particularly for small children. The key variables contributing to risk on this site are the arsenic concentration in soil, the rate and duration of soil intake, and the size of the individual. Together they determine the dose in mg/kg/day. The primary exposure pathway for intake is incidental ingestion of contaminated soil. Other less significant exposure pathways include inhalation of airborne particulate matter, ingestion of fruits and vegetables, and dermal contact. (All D.C. water comes from the Potomac River and meets the applicable EPA Safe Drinking Water Act regulations, and health effects from inhalation are typically associated with an occupational exposure.)

Health effects associated with arsenic toxicity include those that are non-cancerous and those that are cancerous. The most sensitive non-cancerous effects associated with inorganic arsenic toxicity are skin changes (pigmentation changes and thickening of skin). Blood effects (anemia and low blood cell counts), neurological effects (peripheral neuropathy), gastrointestinal effects (nausea, vomiting, cramps, etc), or vascular effects (thickening of the blood vessels) generally require a higher dose than that needed for skin changes. Cancer risks for ingestion of inorganic arsenic include skin cancer, lung cancer, bladder cancer, and perhaps kidney, liver or prostate cancer. Risks for cancer are dose and duration dependent.

The ATSDR has provided an acute minimal risk level (MRL) for health effects at 0.005 mg/kg/day, where no effects are expected to occur with a short-term exposure (up to two weeks). Its chronic MRL is 0.0003 mg/kg/day, where no health effects are expected to occur for long-term exposures. The threshold for skin changes is generally thought to be around a dosage of 0.01 mg/kg/day and around 0.05 mg/kg/day for the other non-cancerous effects. Depending on the dose, the effects can be more or less severe, and begin to occur within months to a few years. Certainly, much higher doses would have even more acute effects. Levels as low as 0.001 mg/kg/day could be associated with some skin changes if exposure occurs over many years.

Translating these acute and chronic exposure limits for no health effects or threshold health effects into risk is a complicated and inexact science. Consider what may be a worst-case scenario: a small (10 kg) child who ingests what the EPA considers an upper-bound estimate on the amount of incidental soil ingestion – 200 mg/day. Where the arsenic in soil is 50 mg/kg (commonly referred to as parts per million – ppm), the intake dose would be 0.001 mg/kg/day. At 100 ppm it is 0.002 mg/kg/day. At 500 ppm it is 0.01 mg/kg/day and at 1000 ppm it is 0.02 mg/kg/day. If the child ingests twice the amount of soil a day, the dose would double, and if the child weighs twice as much, the dose would be halved. Comparing these daily intake values with the ATSDR's MRLs and health effects threshold dosages provided above, only at the highest levels of arsenic soil contamination (over 500 ppm) do we see the potential for acute health effects. Also note that the EPA has calculated a risk-based concentration for arsenic in soil to be 43 ppm based on an excess lifetime cancer risk of 1 in 10,000, which is at the upper range of the "acceptable risk" for cancer as defined in the National Contingency Plan (40 CFR 300).

Note that the risk exposure limits (e.g. MRL) are based on ingestion of soil of the same high concentration on a daily basis over many years, which is unlikely. More importantly, the toxicity values are taken from studies of arsenic in drinking water, which is soluble and considered more bioavailable than soil arsenic. Both of these facts suggest that use of the currently available risk assessment/toxicity values will actually overestimate the risk associated with ingestion of arsenic-contaminated soil at the Spring Valley site.

Question 4a: Have any cancer or health studies been conducted on or in proximity to the Spring Valley properties? If so, please provide these studies.

4a. In response to elevated arsenic levels discovered on the American University Child Development Center grounds, the Agency for Toxic Substance and Disease Registry (ATSDR) conducted an arsenic exposure study for the CDC's students on January 31 to February 1, 2001 at the request of the D.C. Health Department. The results of this study, which may provide an indication as to whether the children have been exposed to arsenic in the past 6-12 months, will be reported to parents in early March 2001.

Question 4b: Is the Army Corps willing to fund a full epidemiological study pursuant to the request of the DC government?

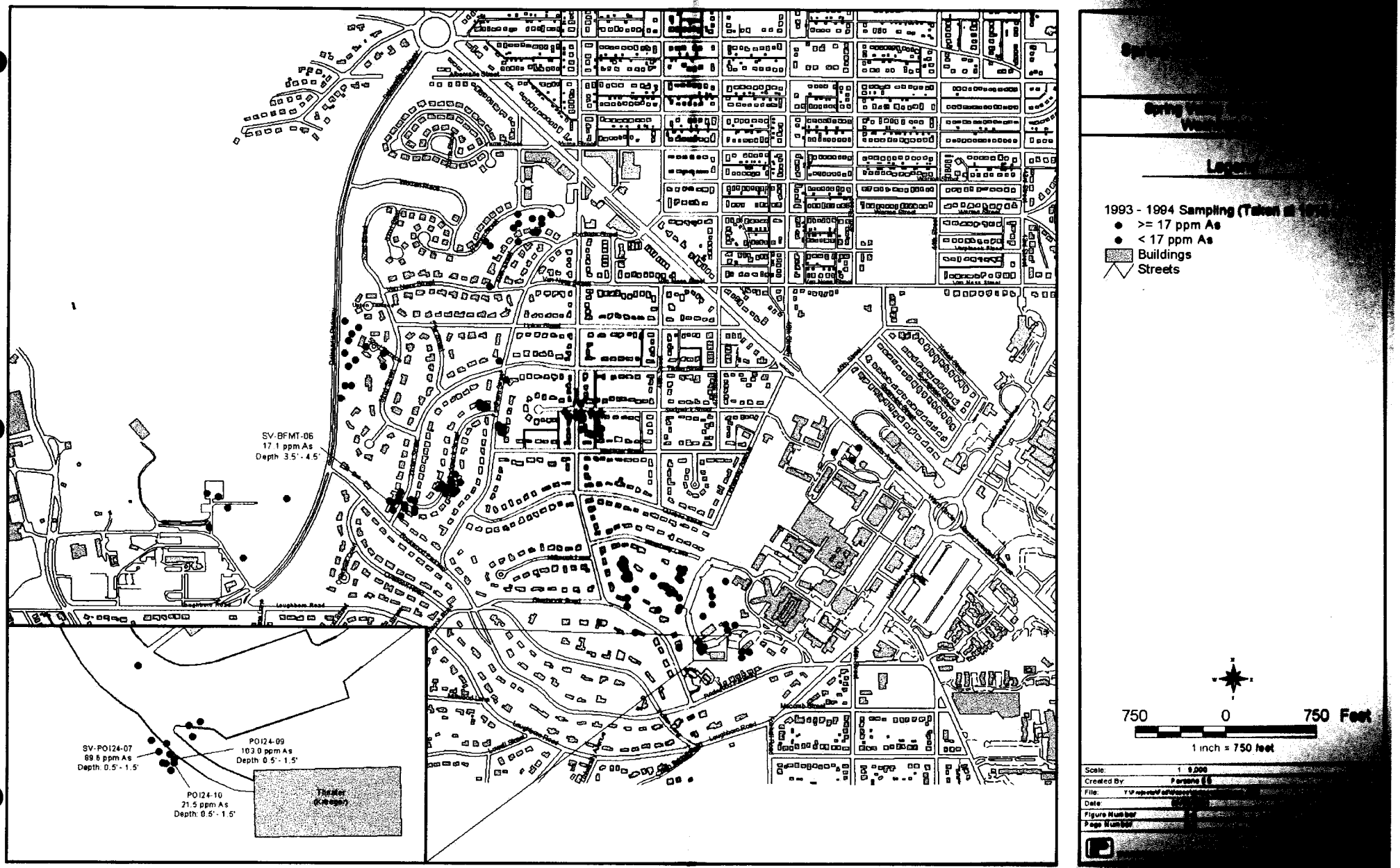
4b. [In developing this response, the Baltimore District sought and received input from the Office of the Assistant Secretary of the Army for Installations and Environment (ASA (I&E) and from CHPPM.]

CHPPM supports an exploratory health study to evaluate available health and demographic information to assess the occurrence of specific health effects in defined geographic areas. It also recommends that an expert independent third party (a party other than the D.C. government or ATSDR) should conduct the study.

The ASA (I & E)'s office agrees with CHPPM's recommendation and believes an exploratory evaluation is needed before the Army commits to a full epidemiological study. The Army is willing to fund an exploratory evaluation.

Question 5: Provide a copy of all arsenic testing results in the vicinity of the Spring Valley site, including the results of the American University child care center. Please indicate how deep the elevated levels have been found in the soil as a result of core borings.

Attachments 8.1 through 8.7 provide arsenic testing results within Spring Valley and the sample depth of elevated results.


SV-BFMT-06
17.1 ppm As
Depth: 3.5' - 4.5'
SV-PO124-07
89.6 ppm As
Depth: 0.5' - 1.5'
PO124-09
103.0 ppm As
Depth: 0.5' - 1.5'
PO124-10
21.5 ppm As
Depth: 0.5' - 1.5'
Theater
(Keegan)
Loughboro Road
1993 - 1994 Sampling (Taken
>= 17 ppm As
< 17 ppm As
Buildings
Streets
750
0
750 Feet
1 inch = 750 feet
Scale:
Created By:
File:
Date:
Figure Number
Page Number

Question 6: Provide a map of the locations of all munitions found in the vicinity of the Spring Valley site, and the date upon which they were found.

See Attachment 9.1.

Attachment 9.1

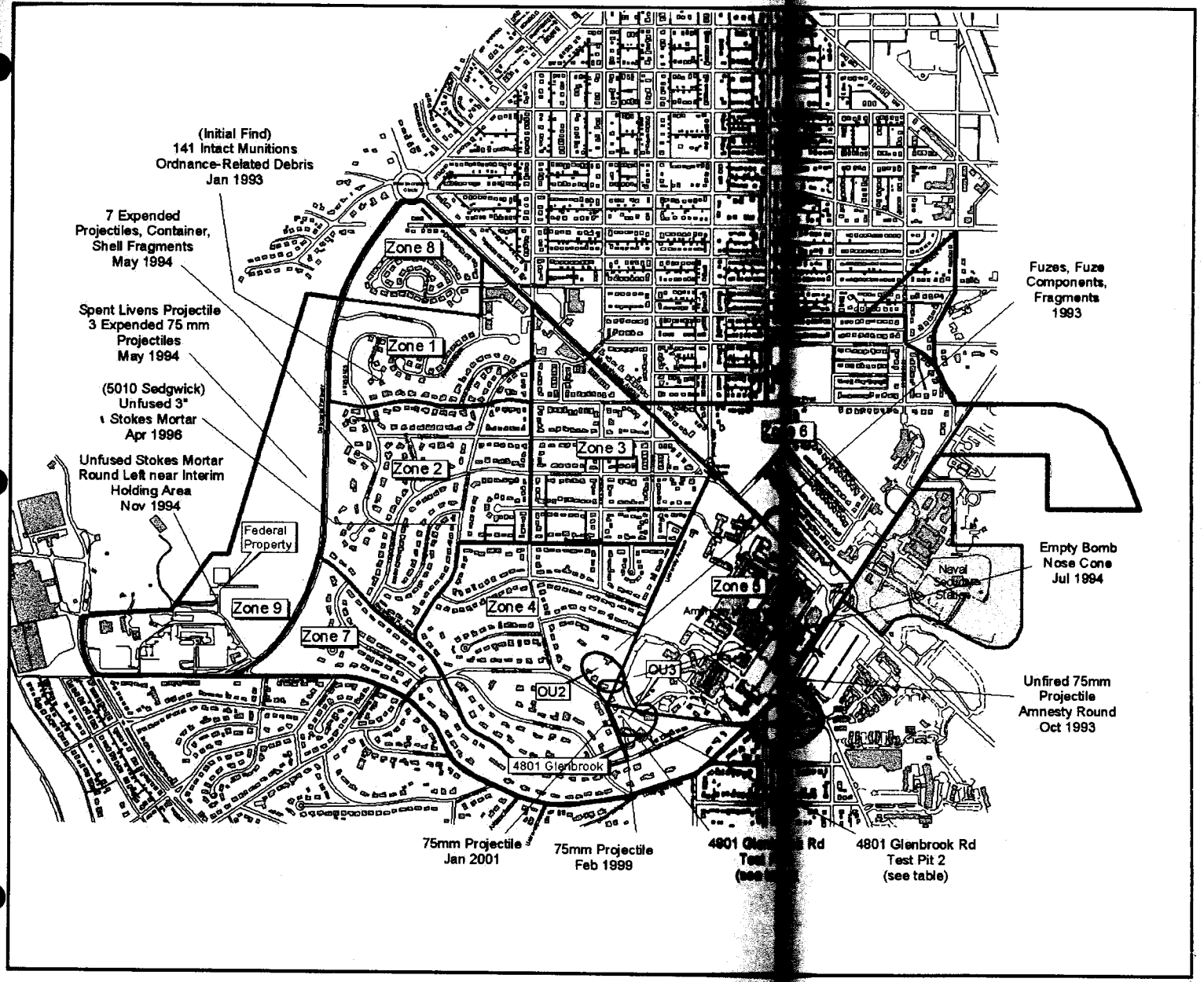


Figure X-X
Location Map
Spring Valley Munitions Finds

Spring Valley Operable Unit 3
Washington D.C.

Legend

- Spring Valley Boundary
- Spring Valley Zones
- Roads
- Camp Leach
- Naval Security Station

4801 Glenbrook Road (April 99 - Feb 00)

Test Pit 1

53	75 mm Projectile
3	3" Stokes Mortar
1	4" Stokes Mortar
2	4.7" Common Projectile

Test Pit 2

66	75 mm Projectile
106	3" Stokes Mortar
4	3" Stokes Smoke
26	6" Livens Projectile
17	3" Wooden Stokes Mortar
2	4" Stokes Mortar
2	4.2" Mortar
44	4.7" Common Projectile
2	6" Projectile
1	60 mm Projectile
4	100 mm Projectile

Question 7: Provide all copies of Remedial Investigations and Anomaly Reports pertaining to the vicinity of the Spring Valley site.

Per phone conversation on February 9, 2001, between Mr. Chris Knauer of Congressman Dingell's staff, and CPT Mike Peloquin, the USACE Baltimore District POC, the response for Questions 7 and 8 has been limited to the key dozen or so documents that provide summary results and the history of the Corps' activities at the Spring Valley site. Also requested was a list of the documents provided and another list of the documents not provided but maintained at the Baltimore District office.

The following documents have been included:

A Brief History of the American University Experiment Station and U.S. Navy Bomb Disposal School, American University. Martin K. Gordon *et. al.*, Headquarters, USACE, Office of History. June 1994.

Action Memorandum: Non-Time-Critical Removal Action for Arsenic-contaminated soils at 4801, 4825, 4835 Glenbrook Rd, N.W., Washington, D.C.

American University, Summary of USATHAMA Investigations Conducted In 1986. U.S. Army Toxic and Hazardous Materials Agency, 1993.

Existing Conditions Report Spring Valley Remedial Investigations, Washington, D.C. USACE, Baltimore District. June 25, 1993.

Revised Final Engineering Evaluation/Cost Analysis, 4801, 4825, and 4835 Glenbrook Road, Washington, DC (includes risk assessment). USACE, Baltimore District. October 30, 2000.

Final Report Conducted on President's Residence, 4835 Glenbrook Road, Washington, DC. Apex Environmental, Inc. 1996.

Geophysical Investigation Report. Republic of South Korea Ambassador's Residence for the Operation Safe Removal Formerly Used Defense Site, Washington DC. USACE, Huntsville Engineering & Support Center and Baltimore District. March 2, 1998.

Geophysical Investigation Report, 4801 Glenbrook Road, Spring Valley Operable Unit 3, Washington, D.C. USACE, Huntsville Engineering & Support Center and Baltimore District. May 1999.

Inventory Project Report, FUDS Property No. C03DC0918, with Addendums. USACE, Baltimore District. 1993 – 2000. (Four documents dated 3 Feb 93, 15 Oct 93, 3 Jan 95, and 26 May 00.)

Remedial Investigation Evaluation Report for the Operation Safe Removal Formerly Used Defense Site, Washington DC. USACE, Huntsville Engineering & Support Center and Baltimore District. January 8, 1998.

Remedial Investigation Report for the Operation Safe Removal Formerly Used Defense Site, Washington DC. USACE, Huntsville Division and Baltimore District. June 1, 1995.

Remedial Investigation Report for the Spaulding and Captain Rankin Area Operation Safe Removal Formerly Used Defense Site, Washington, D.C. Volume I: Sections 1-10. USACE, Huntsville Division and Baltimore District. June 14, 1996.

Site Safety Submission, Volumes 1-3, with Addendums and Changes. USACE Huntsville, Engineering and Support Center and Baltimore District. 1998-2000.

Washington, DC Army Munitions Site, Spring Valley, Draft Risk Assessment Report. U.S. EPA Region III. October 1999.

Work Management Plan Remedial Investigation/Feasibility Study (RI/FS), Spring Valley Operable Unit 4, Washington DC . USACE Baltimore District. August 14, 2000.

Attachments 10.1 and 10.2 list documents not provided but available at the Baltimore District office.

Documents Not Provided

EPA Region III Trip Reports for OU-3 with Appendices

Anomaly Review Board Findings (Binders 1 and 2), 1993-1995.

[The Remedial Investigation Reports for OU-3 and OU-4 have not yet been published]

NOTES:

Due to their small size, three of the fifteen attached documents are included in one binder. Included in that binder is a memorandum documenting the withdrawal of one of the nine Addendums to the Site Safety Submission (Addendum 5), which is not included.

Attachment 10.2

[NOTE: Please see separate link on web site for attachment 10.2]

Question 8: Provide all contractors' reports pertaining to the entire Spring Valley site.

Per phone conversation on February 9, 2001, between Mr. Chris Knauer of Congressman Dingell's staff, and CPT Mike Peloquin, the USACE Baltimore District POC, the response for Questions 7 and 8 has been limited to the key dozen or so documents that provide summary results and the history of the Corps' activities at the Spring Valley site. Also requested was a list of the documents provided and another list of the documents not provided but maintained at the Baltimore District office.

See list of documents provided in response to Question 7, above.

Question 9: Provide information pertaining to the law suit or claims brought on behalf of the Korean Government pertaining to the residence located in the vicinity of the Spring Valley site, including the amount and nature of the claim and schedule for court disposition, if any.

9. The Korean Government filed a claim against the United States Government under the Federal Tort Claims Act on December 27, 2000. The amount claimed is $3,261,700.00, comprised as follows:

- decrease in the value of the property – $2,250,000.00
- loss of use of the property – $700,000.00
- negative impact on the lives and functions of the ambassador and employees – $100,000.00
- cost of time spent by embassy personnel on events surrounding remediation of the contamination – $98,000.00
- costs of environmental consultants -- $32,330.00
- costs of attorney fees – $113,700.00
- indemnification for all claims against the Korean government by its employees for exposure to arsenic – amount unknown

The claim is in the administrative stage required prior to the filing of any court action. The United States has six months to dispose of the claim. If the matter is not resolved within six months, the Korean Government may file suit in Federal Court.

Question 10: Are there, or have there been any other law suits against the United States Government pertaining to the Spring Valley site? If so, provide the nature and amount of the claim and disposition, if any.

10. There have been two lawsuits filed and disposed of pertaining to the Spring Valley site.

a. Miller v. United States, 963 F. Supp. 1231 (D.D.C. 1997): Beginning in 1927, the Miller Companies accumulated about 300 acres in northwest Washington, D.C., which it then developed into the area now known as Spring Valley. While excavating to construct a new house in 1993, the developer uncovered buried munitions. The Miller Companies subsequently sued the U.S. for $14 million, for expenses incurred in assisting the Army during its investigation, for defending itself against homeowners' legal proceedings, and for combating the effects on its business of the uncertainty in the community caused by the discovery of the buried munitions. The U.S. District Court for the District of Columbia found that the U.S. had breached its duty by failing to warn of the buried munitions. The case was then settled out of court for $2.1 million.

b. Miller and Hicks, et al. v. US, 173 F.R.D. 1 (D.D.C 1997): This case involved a suit by three homeowners (E. Conrad Hicks, Ronald Wood, and Patricia Wood). The amount claimed is unknown, but the suits were for alleged loss of equity when these individuals sold their properties. The suits were dismissed, because the claims were filed after the statute of limitations had run out.

c. Thomas and Kathi Loughlin filed a claim against the United States Government under the Federal Tort Claims Act on February 20, 2001, on behalf of themselves and their minor children. The amount claimed is $2,108,109.80, comprised as follows:

- utilities, taxes, mortgage and insurance while the Loughlins were evacuated from their home by the Corps - $38,024.55
- consulting and legal fees - $106,499.88
- medical bills not paid by insurance for treatment to Kathi Loughlin for a brain tumor - $6,585.37
- medical monitoring and diagnostic testing of all the Loughlins for an indeterminate period of time - $450,000.00
- pain and suffering for Ms. Loughlin's brain tumor - $500,000.00
- mental anguish for all the Loughlins - $1,000,000.00

The claims are in the administrative stage required prior to the filing of any court action. The United States has six months to dispose of the claims. If the matters are not resolved within six months, the Loughlins may file suit in Federal Court.

Question 11: Does the Army Corps provide the Environmental Protection Agency or the D.C. Department of Health with any funding for oversight activities at Spring Valley? If so, please identify the funding that had been provided to each oversight agency.

Headquarters, U.S. Army Corps of Engineers (HQUSACE), as executing agent for the Department of Defense for the Department of Defense and District Memorandum of Agreement (DDMOA) with the District of Columbia, reimburses the D.C. Department of Health (and formerly the Department of Consumer and Regulatory Affairs) for the services associated with environmental restoration under the Formerly Used Defense Sites (FUDS) program at Spring Valley.

Payments have been made for services provided since 18 October 1993 in the amount of $284,160.69. Sometime after July 1, 1998, permission to pay an additional $1,435,707.68 was received from FUDS program managers; however, D.C. has not yet provided accurate Requests for Reimbursement, which are needed for payment. HQUSACE is currently working with the D.C. government to get the necessary forms. Payment will be made upon receipt.

Question 12. Why was activity stopped at the Holmes property (OU2) after elevated arsenic levels were reportedly detected and other anomalies had not been investigated? What are the Army Corps plans for further investigation of this residential property? Does the manner in which this site was handled indicate a problem with the anomaly review board process?

Attachment 15.1 is a copy of the Spring Valley Situation Report from August 23, 1993, which describes the suspension of geophysical survey operations at 4710 Woodway Lane. At approximately 1000 AM, Henry Hubbard, the USACE, Huntsville safety representative, stopped all operations when he was informed via phone that air samples collected from boreholes on August 19th tested positive for Lewisite. At 2 PM the same day, the site received information that the test could only confirm the presence of arsenic, not Lewisite. Sample results for August 20th reported a negative test for arsenic.

As of 4 PM on August 23, 1993, all geophysical surveying operations at 4710 Woodway Lane remained indefinitely suspended by the Corps' project officer to evaluate the impact of the arsenic reading. No further report was made regarding operations at this property until the weekly Situation Report on August 26, 1993 (Attachment 15.2). This report simply states that EODT, the contractor doing the geophysical survey work for the Corps of Engineers, completed its operations at 4710 Woodway Lane.

The Anomaly Review Board (ARB) reviewed the geophysical survey reports from 4710 Woodway Lane on four different dates. MAJ Plaisted, the current Spring Valley operations officer, summarized the results of those reviews in a letter to the property owner dated December 8, 2000 (Attachment 15.3). In it, he concludes that there is no documentation to show that 12 of the 18 anomalies on the property were investigated or evaluated by the ARB. He recommends further evaluation of the records and the site.

At this time, the Spring Valley operations office is investigating the feasibility of additional geophysical survey work at 4710 Woodway Lane and has been in weekly contact with the homeowner.

The manner in which this property was handled does not indicate a problem with the ARB process. Rather, the conclusions reached by MAJ Plaisted reflect either a shortage of information used in his evaluation (due to incomplete records) or a unique case of omission by the ARB. Our review of dozens of other ARB findings suggests neither a widespread instance of omissions nor a flaw in the ARB process.

Attachment 15.1

SITUATION REPORT
LOCATION: SPRING VALLEY
AS OF 231600 AUG 93

SPECIFIC:

On 19 Aug 93, (2) arsenic impingers (bubblers) collected air samples during routine side scanning operations. The bubblers were shipped back to Edgewood Arsenal on 19 Aug 93 by TEU personnel for analysis. The results of the laboratory analysis were received telephonically onsite at 231000 Aug 93 by RTAP personnel. The telephonic report indicated a presence of Lewisite. All operations were ceased immediately by the onsite Huntsville safety representative based on above report of Lewisite. Work for the day was ceased by site operations based on the telephonic report. Later, 231400 Aug 93 site operations received information that the test could only confirm arsenic not Lewisite. The reported levels of arsenic were 0.0148 and 0.0039 mg/m^3. This is in comparison to the acceptable time weighted average (TWA) of 0.003 mg/m^3. The TWA is the maximum acceptable concentration that a worker working 8 hours a day 5 days a week can be exposed to without exhibiting longterm chronic health effects.

Air sampling continued on 20 and 23 Aug 93 for 4710 Woodway Lane with the continuation of side scanning operations. The analysis conducted by Edgewood Arsenal for air samples taken with the bubblers on 20 Aug 93 were negative for arsenic.

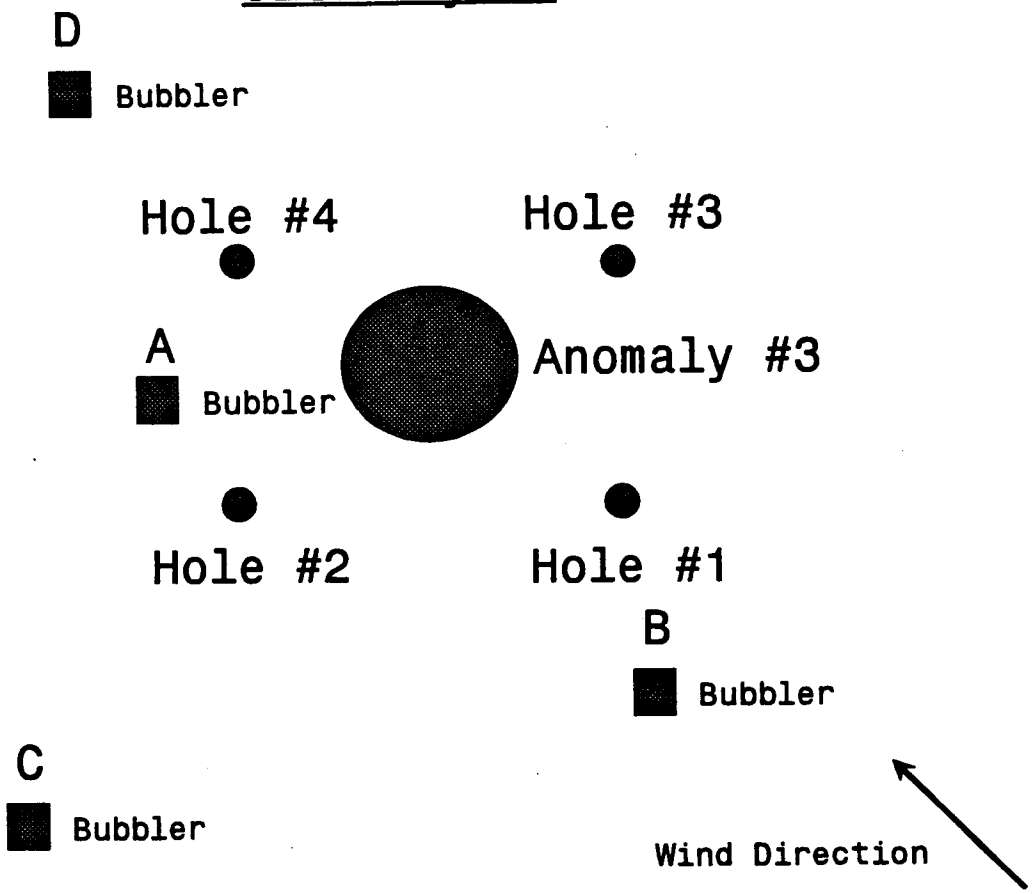
Action taken on 23 Aug 93 by TEU personnel include air sampling with new bubblers near the site of the positive test on Thursday 19 Aug 93. On 231730 Aug 93 site operations received the results of this latest test indicating that levels of arsenic were below detectable limits. Because the boring holes were back filled with soil, the second test will be valid for background levels of arsenic, and may not accurately reflect the levels of arsenic if any in the previously open bore holes. This demonstrates that the background levels are arsenic are below detectable limits (BDL).

Currently all ongoing operations have ceased. The Corps of Engineers along with the safety community, TEU and EODT are assessing the impact of such a find on our operations. Courses of actions are currently being developed that reflects our assessments.

Prepared by CPT Fleming / CPT Turner

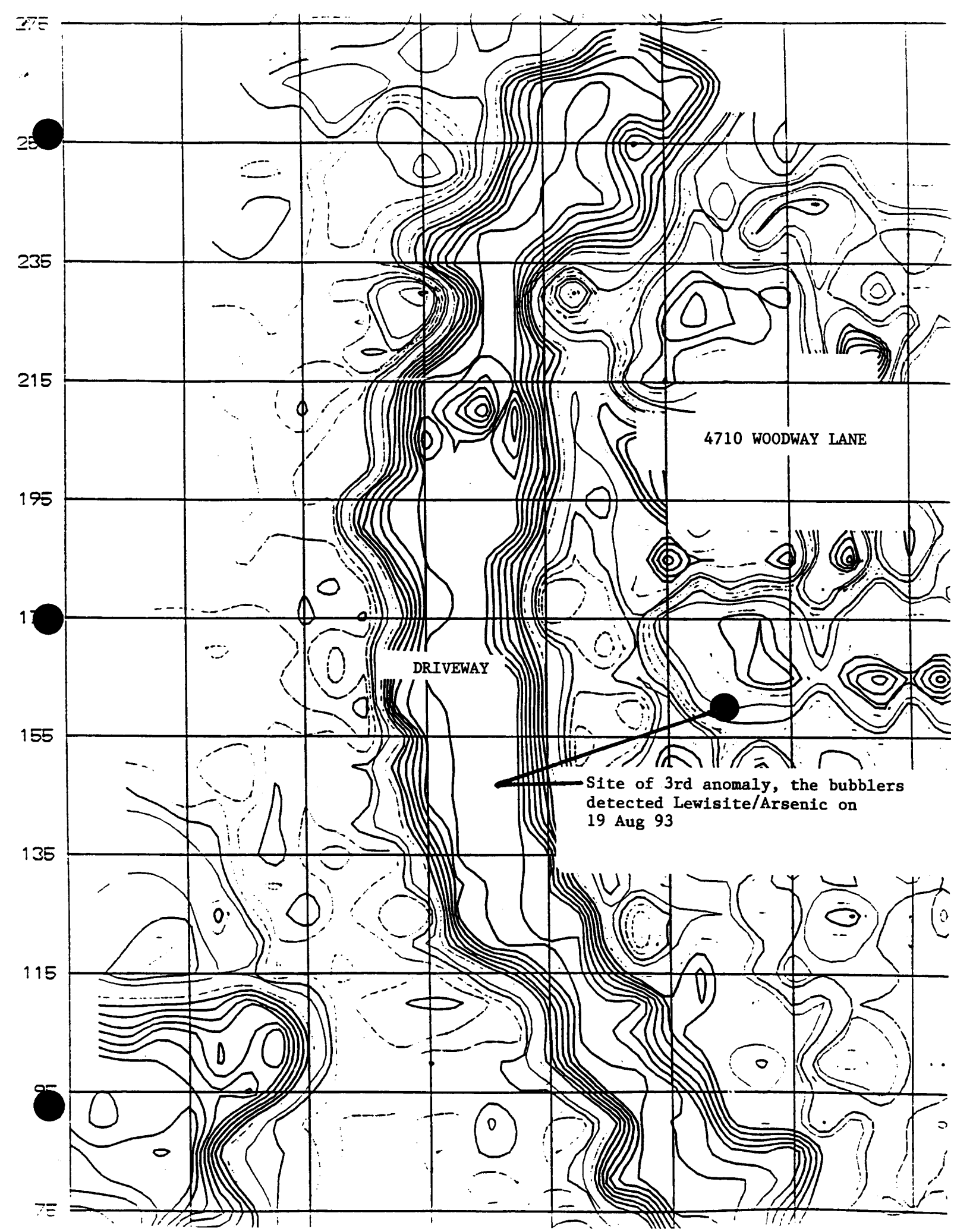
Reviewed by LTC Crotteau

Site Layout



Anomaly #3 is shown above with the four bore holes and four air samplers (bubblers). The bubblers are identified as A,B,C,D and are shown in their relative positions. Bubbler D collected two samples that were identified as positive for arsenic. During the hours of 1300 - 1610 on 19 Aug 93, holes #2,3,4 were bored in the following sequence, 4,3,2. Earlier in the day hole #1 was bored, back filled, and then the bubblers were switched out. So that at 1300 hrs new bubblers were in place during the time when holes #4,3,2, were bored. It cannot be determined from exactly which hole the contaminant may have been released.

The results of the side scanning operation indicated that the anomaly might be twisted or in two separate sections. Readings taken from hole #1 indicate that the anomaly is at a depth of 1 - 3 ft and approx. 16" in width. Readings taken from holes #2,3,4 are similar. The anomaly is at a depth of 5 - 6.5 ft and approx. 12" - 18" in width.

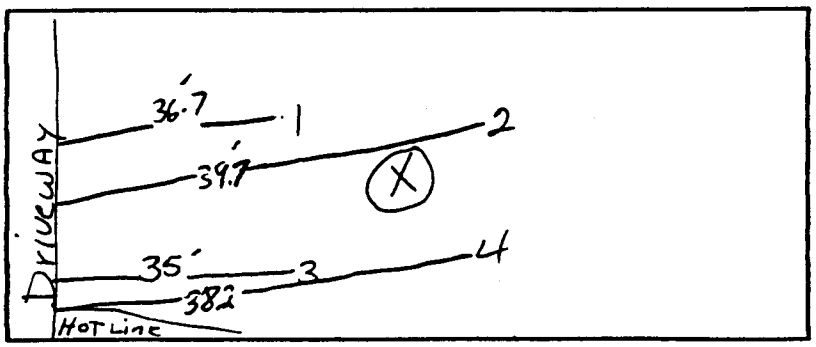

275
235
215
195
155
135
115
75
4710 WOODWAY LANE
DRIVEWAY
Site of 3rd anomaly, the bubblers detected Lewisite/Arsenic on 19 Aug 93

SIDE SCAN BORING/ANOMALY LOCATION GRAPH

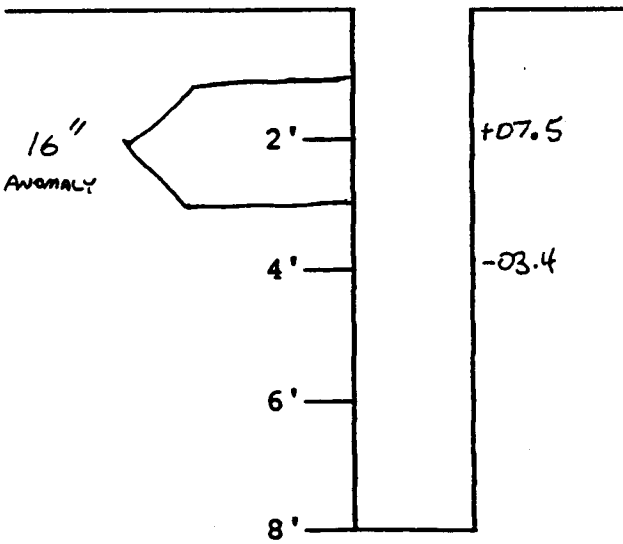
ADDRESS 4710 WOODWAY DATE 8-19-93

Anomaly 3+

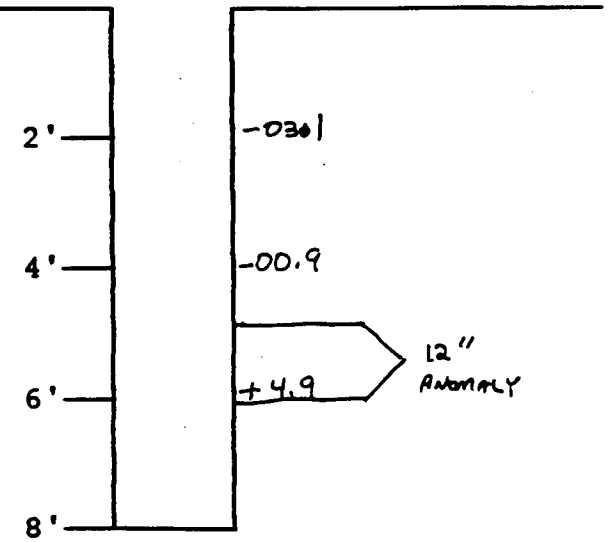
ABOVE GROUND DRAWING



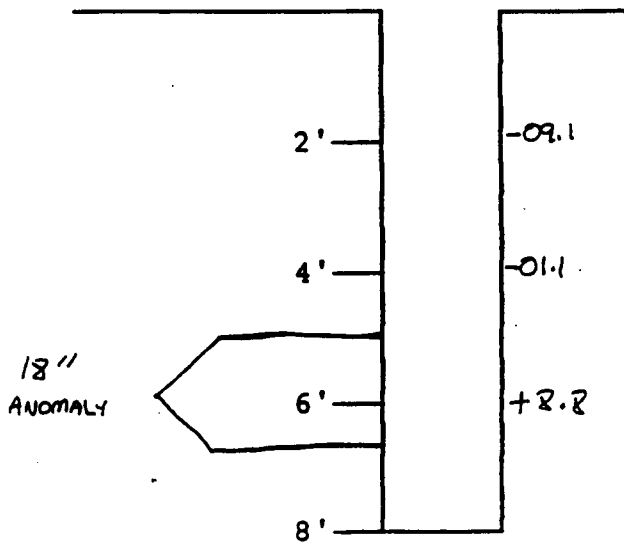
HOLE 1



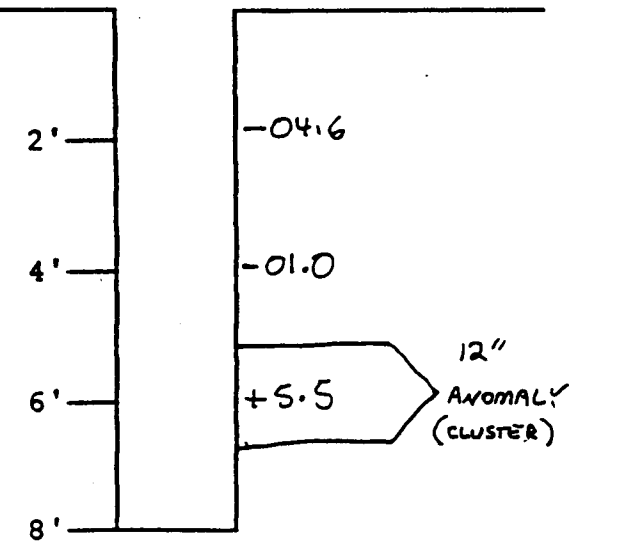
HOLE 2



HOLE 3



HOLE 4



PROBLEM: TO DETERMINE THE CONCENTRATION OF ARSENIC RELEASED AND THE SIGNIFICANCE OF THAT AMOUNT.

GIVEN: AMOUNT RELEASED

$A = 0.0148\ mg/M^3$

$D = 0.0039\ mg/M^3$

TLV, THRESHOLD LIMIT VALUE.

ACTION LEVEL = $0.003\ mg/M^3$

MW $As = 74.9216\ g/mole$

CONVERSION FACTOR.

$$ppm = \frac{mg/M^3 \times 24.45}{MW}$$

$1\ M^3 = 1000\ L$, For a gas $1\ mole/22.4\ L$ @ STP

A. $0.0148\ mg/M^3 \cdot \frac{24.45}{74.9216} = 0.00483\ ppm.$

$\therefore$ 0.00483 ppm, 4.83 ppb. ←

$0.0039\ mg/M^3 = 0.00127$

$\therefore$ 0.00127 ppm, 1.27 ppb ←

B. THE ACTION LEVEL FOR LEWISITE/$As = .003\ mg/M^3 = 0.000979\ ppm.$

FOR 0.00483 = 393 % INCREASE

FOR 0.00127 = 30 % INCREASE ←

C. As a comparison the WATER QUALITY STANDARDS FOR $As = 0.05\ ppm.$

$\therefore 0.05\ ppm \gg 0.00483 > 0.00127 > 0.000979.$

Attachment 15.2

SITUATION REPORT
LOCATION: SPRING VALLEY
AS OF 261200 AUG 93

1. GENERAL:

-- Rights of Entry update. For Zone 1 a total of (125) of the (131) ROEs required were obtained to include Miller owned properties. For Zone 2 (161) of the (202) ROEs required have been obtained. For Zone 3 (153) of the (249) ROEs required are currently on-hand. In Zone 4 (145) of the (182) ROEs required are on-hand. In Zone 5 (2) of (2) ROEs required are on-hand. In Zone 6 (121) of (236) ROEs required are on-hand. In Zone 7 (38) of (90) are on-hand. In Zone 8 (62) of the (74) ROEs required are on-hand. The total numbers required for each zone reflect all the homes in each particular zone. Within Spring Valley as a whole a total of (807) of the (1166) required ROEs are on-hand, (69% on-hand), no change from previous report. We have received (441) of the (463) required prioritized properties, (95% of prioritized properties on-hand). We have currently identified (27) home owners who have either refused to sign a ROE or who were unable to be contacted.

-- EODT completed operations on 4710 Woodway Lane. This site is located near the WW I bunkers used for testing.

-- Planning continues for the first intrusive operation to beginning on 20 Sep 93. The evacuation area will initially be 75 ft, and if the anomaly is OEW then it will be safed and the evacuation area enlarged to the NO Significant Effects (NOSE) distance.

-- On 191530 Aug SVRO provide a site briefing and orientation to a visiting British Exchange Officer from the Engineer School.

-- On 201330 Aug LTC Crotteau briefed Mr. Walker on the status of the project at Spring Valley.

2. OPERATIONS:

a. Previous week:

-- EODT continued their efforts to eliminate anomalies in zones 1,2,3, and 4. EODT also continued USRADS data collection in zones 2,3,4 and 6 as well.

b. Recovered Material:

-- Nothing to report.

c. Site Status -- 5 each magnetometers, 2 each 3 man survey teams. USRADS Team #1 is onsite, the second

team has demobilized.

d. Safety/Security:

-- No change.

e. Future Operations:

-- Zone 1, EODT is currently refining their records of data analyses previously performed.

-- Zone 2, Further investigation continues in order to resolve anomalies in the analyzed data. Data analysis continues.

-- Zone 3, USRADS investigation continues.

-- Zone 4, USRADS data collection and analysis continues for the surrounding area.

-- Zone 5, EODT is still awaiting the preliminary results of their efforts. The data must be enhanced and refined before the analysis can be completed.

-- Zone 6, USRADS collection will continue.

-- Zone 7, No activity this week.

-- Zone 8, No activity this week.

f. Tentative Schedule for other meetings:

-- 26 Aug Zone Capt's. meeting, 1800 hrs.

-- 02 Sep Zone Capt's. meeting, 1800 hrs.

3. PUBLIC AFFAIRS:

-- The letter regarding the scheduled evacuation meetings on 9 and 10 Sep will be mailed this week to the zone captains, supporting agency officials, and residents.

4. RESEARCH:

-- Nothing to report.

5. HOMEOWNERS/RESIDENTS:

-- Nothing to report.

6. CIVIL AUTHORITIES:

-- Nothing to report.

7. ISSUES/REQUIREMENTS:

(1) LSA: Local Support Agreement outlining reimbursement procedures for services during Phase II, is currently being reviewed by Department of the Army Office of Counsel. After review by the office of counsel it will be forwarded to the Office of Management and Budget for final approval. No change from previous report.

(2) Construction Site Clearance: The MOA is currently at DC Department of Consumer and Regulatory Affairs awaiting signature by the acting director.

(3) Interim Holding Area: a change order was issued for the installation of a fire suppression and water collection system. Work began today, 26 Aug 93, on this project with the expected completion date of 9 Sept 93.

(4) The MOA between the Corps of Engineers and Military District of Washington (MDW) is currently under review by MDW Counsel. Final agreement is contingent upon counsel's recommendation to the Chief of Staff at MDW.

Prepared by CPT Fleming

Reviewed by LTC Crotteau

Attachment 15.3

DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, U.S. ARMY CORPS OF ENGINEERS
P.O. BOX 1715
BALTIMORE, MD 21203-1715
December 8, 2000

REPLY TO
ATTENTION OF
Programs and Project
Management Division

Priscilla Holmes and Robert Herzstein
4710 Woodway Lane, N.W.
Washington, D.C. 20016

Dear Ms. Holmes and Mr. Herzstein:

I am writing to inform you of an issue that has been raised by Mr. Ricky Stauber concerning the investigation of anomalies in the Spalding and Captain Rankin Areas. Mr. Stauber is currently providing ordnance expertise to the Environmental Protection Agency under a contract with them. In 1993, Mr. Stauber worked for EOD Technology Inc. (EODT), a contractor working for the Corps of Engineers Huntsville Division who performed the geophysical survey of the area. Mr. Stauber currently believes that there are some anomalies that he identified in 1993 that were not adequately investigated. We have reviewed the available documentation for this area encompassing these anomalies, and have concluded that his assertion may have merit. Below is a summary of the available documentation that we have reviewed. I have included the documents for your information.

a) Attachment #1 is a report dated 30 July 1993 which presents EODT's summary of a magnetometer survey completed on the property between 23 June and 28 July. The survey included 21 grids covering all of the front yard area and areas near the house, but it did not include a large portion of the back yard. The memo documents the recovery of numerous ordnance related surface items in the front yard grids, such as fuze components and ordnance fragments. A total of 16 subsurface anomalies were identified on the property, including 13 in the front yard area and 3 in the southwest corner of the backyard. One grid was not investigated at all due to it being classified as "trashy."

b) Attachment #2 is an Anomaly Review Board (ARB) report package dated 9 March 1994. Since the ARB packages are assembled in reverse chronological order, with the most recent documents on top, it will be easier to discuss them starting from the back of the package and working forward. At the back of this package is a second EODT report dated 11 September 1993 which documented the results of a boring/side scan operation for 4 of the 13 anomalies in the front yard area. It is not clear in this report which anomalies in Attachment #1 were the subjects of this side scan. In front of this EODT report are side scan boring anomaly location graphs, and a new site sketch showing the locations of the four anomalies. However, the locations of the four anomalies on this new sketch do not correlate well with the location of anomalies in Attachment #1. On 1 March 1994, Hank Hubbard submitted a memo to the (ARB) stating that two of the side scanned anomalies were metal scrap and two are attributable to an underground electrical line. On 9 March 1994 the ARB concurred with these findings and recommended no further action for these four anomalies.

c) Attachment #3 is another ARB report package dated 15 February 1994. This package includes data from a geophysical survey using EM-31 technology that appears to have been completed by 7 July 1993. On 30 September 1993, Hank Hubbard submitted a memo to the ARB on two anomalies in the back yard area. These anomalies were selected based on the EM-31 geophysical data from the property. It appears that these two anomalies were different from the 16 identified in Attachment #1. In a memo dated 15 October 1993, the ARB recommended the intrusive investigation of these two anomalies. On 7 February 1994, Hank Hubbard reported that one of the anomalies had a large number of magnetic hits some of which were magnetic rocks. The identification of the second anomaly is not specifically addressed, however it was mentioned on the site sketch in Attachment #2 with a note stating that it was a "manhole for servicing the electrical system."

d) Attachment #4 is another ARB report package dated 11 April 1994. In this package, a memo dated 30 March 1994 from Mr. Hubbard identified 78 magnetic rocks in a 15-foot diameter depression at the first anomaly. He also noted that you had informed him that a rock/gravel road had been constructed in the vicinity of this area. By memo dated 11 April, the ARB determines that the first anomaly is resolved.

Based on these documents a total of 18 anomalies were identified on the property (16 by magnetometer and 2 by EM-31). Of the anomalies in the front yard only 4 appear to have been fully investigated and dismissed by the ARB. There is no documentation that the 12 remaining anomalies were either investigated or evaluated by the ARB. Our recommendation is to have Mr. Stauber review the documentation, visit the area, and then identify the remaining areas of concern.

If you have any questions on this matter, please feel free to contact me, at 202-686-3359 or 410-962-6784.

Sincerely,

Brian D. Plaisted

Brian D. Plaisted
Major, Corps of Engineers
Deputy District Engineer
for Spring Valley

Enclosures

Attachment #1

REPORT OF MAGNETOMETER SURVEY

30JULY93

The area and terrain of the magnetometer survey is 2.7 acres of hilly and thick timber to brush. The survey took a total of nine days to complete, from 23 June to 28 July 1993. On each days operation there were three to seven personnel on the site. During this period EODT also performed different side scans,and soil gatherings for analysis.

A map of the property was laid out into twenty one grids/sections alphabetically listed from "A" to "U"; each section was fifty feet wide and one hundred feet long (this was not so if the area would not allow the room; although this is our standard). With knowledge of the property boundaries, a 100 foot tape measure was used to mark out the plots. A wooden stake, which had been marked for that particular section, was then driven into the ground to show the magging crew each sections boundaries. Each section was divided into five foot lanes, running the length of the section. The CV-72-GA Schonsetdt magnetometer was used to perform the survey. The 72s were calibrated at the beginning of each work day and all readings are taken with the magnetometer setting on the 10 scale. A master map of the entire property. The master map depicts all finds, and is color coded. Along with master map are plot maps of each survey section, which give the findings, by type and distance measurement locations from closest end of the particular lane it was found in.

The following is a list symbols which show the spot of findings on the plot maps;

1. X = Subsurface Anomaly
2. F = Frag
3. FC = Fuze Components
4. Z = Complete Fuze
5. S = Slag

23 June 1993, day one, section "A" findings; one MK 1 chemical projectile fuze, two outer fuze windshields, and one piece of 75mm frag.

Section "B" yeild, one fuze component.
Section "C" yeild, four subsurface anomalies.
Section "D" yeild, one fuze component and two pieces of 75mm frag.
Section "E" yeild, one subsurface anomaly.

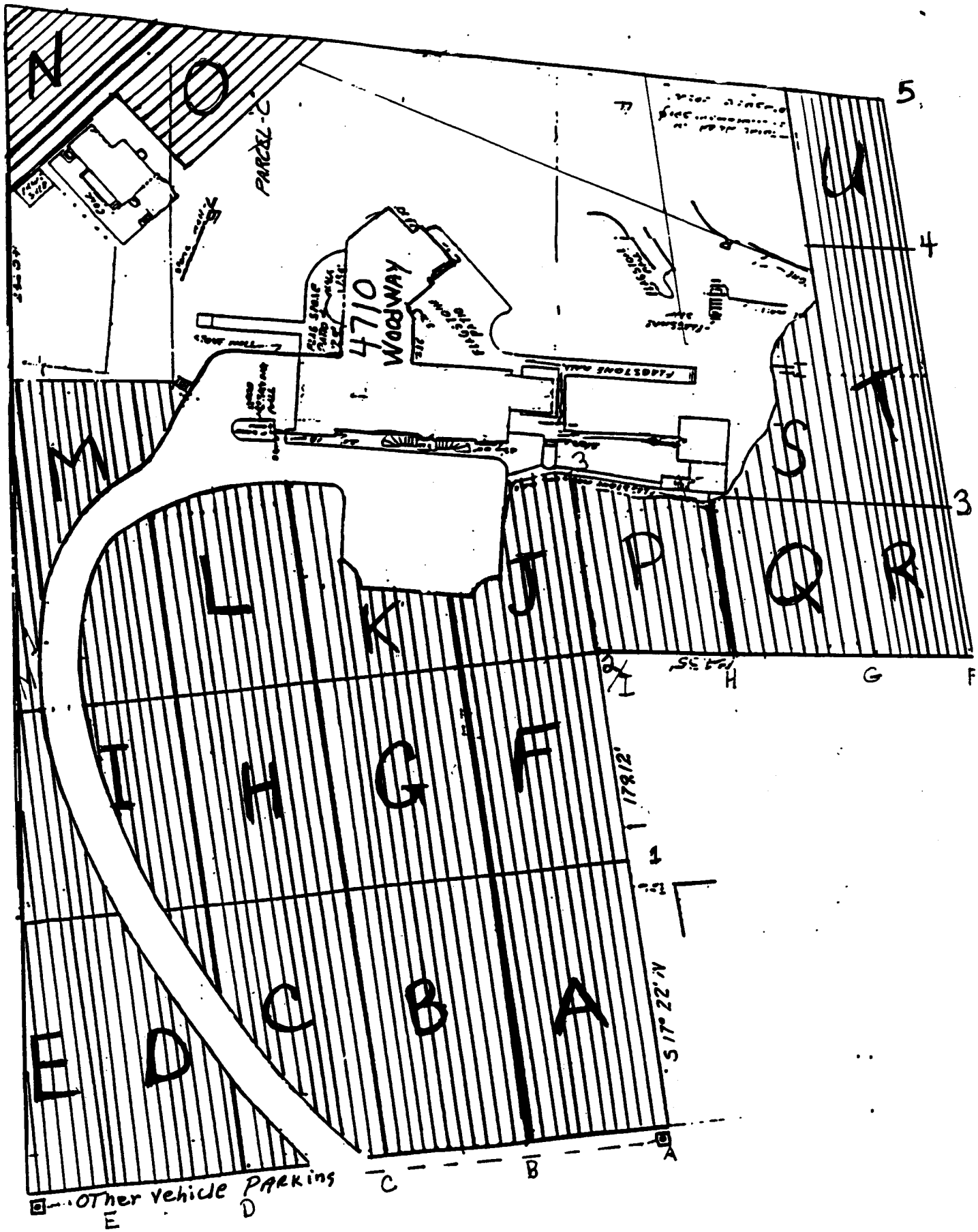
20 July 1993, Finished section "E", no other finds.
Section "F" Yeild, two fuze components.

21 July 1993, Section "G" yeild, two pieces of frag.
Section "H" two subsurface anomalies, one piece of slag, and two power lines,one new/ one old running the length of plot.
23 July 1993, Section "I" yeild, one MK1 bomb tail fuze.
Section "J" yeild, one MK2 bomb tail fuze.
Section "K" yeild , one 75mm base frag, and one base deliniating fuze.
26 July 1993, Section "L" yeild, one subsurface anomaly, and one piece of 75mm frag.
Section "M/M1" yeild, five subsurface anomilies.
27 July 1993, Section "N" yeild, no finds.
Section "O" yeild, to trashy to mag.
Section "P" yeild, one piece of 75mm frag.
Section "Q" yield, no finds.
28 July 1993, Section "R" yield, no finds.
Section "S" yield, one subsurface anomaly.
29 July 1993, Section "T" yield, one subsurface anomaly.
Section "U" yield, one subsurface anomaly.

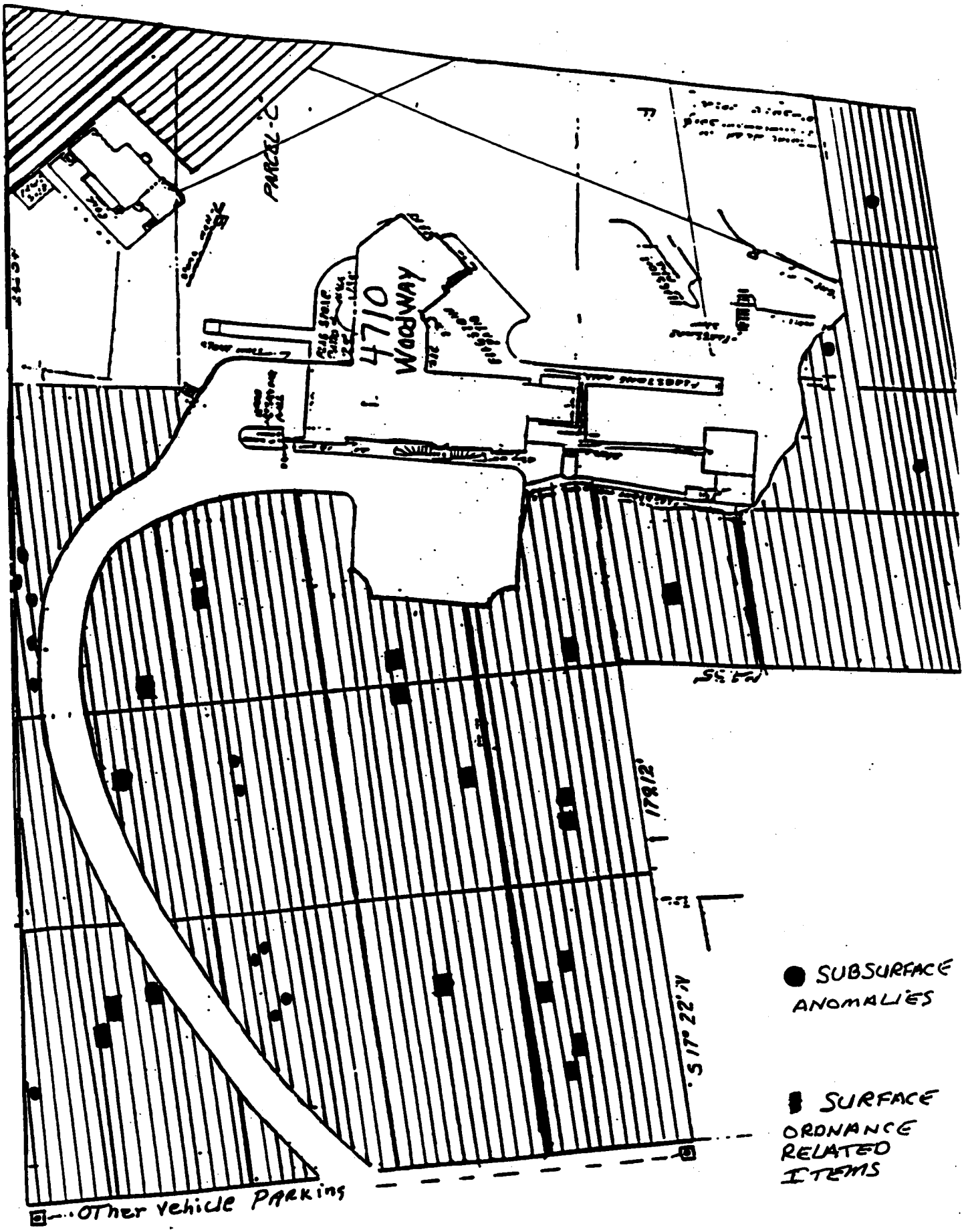
Enclosures include;
1. Master Map
2. Plot Maps(21)

This concludes my report of the magnetometer survey of the property of 4710 Woodway Lane.

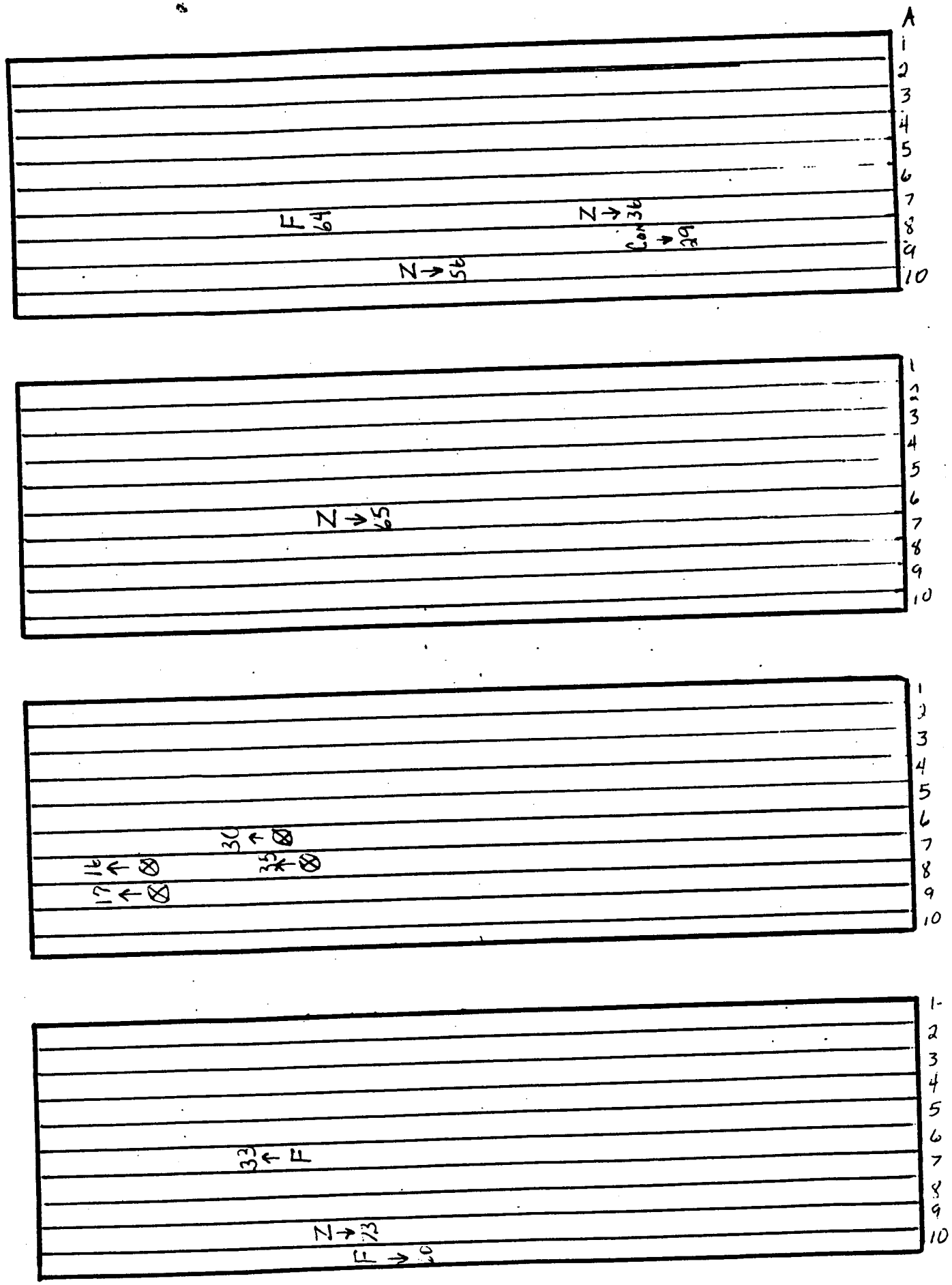
4710 WOODWAY GRID MAP



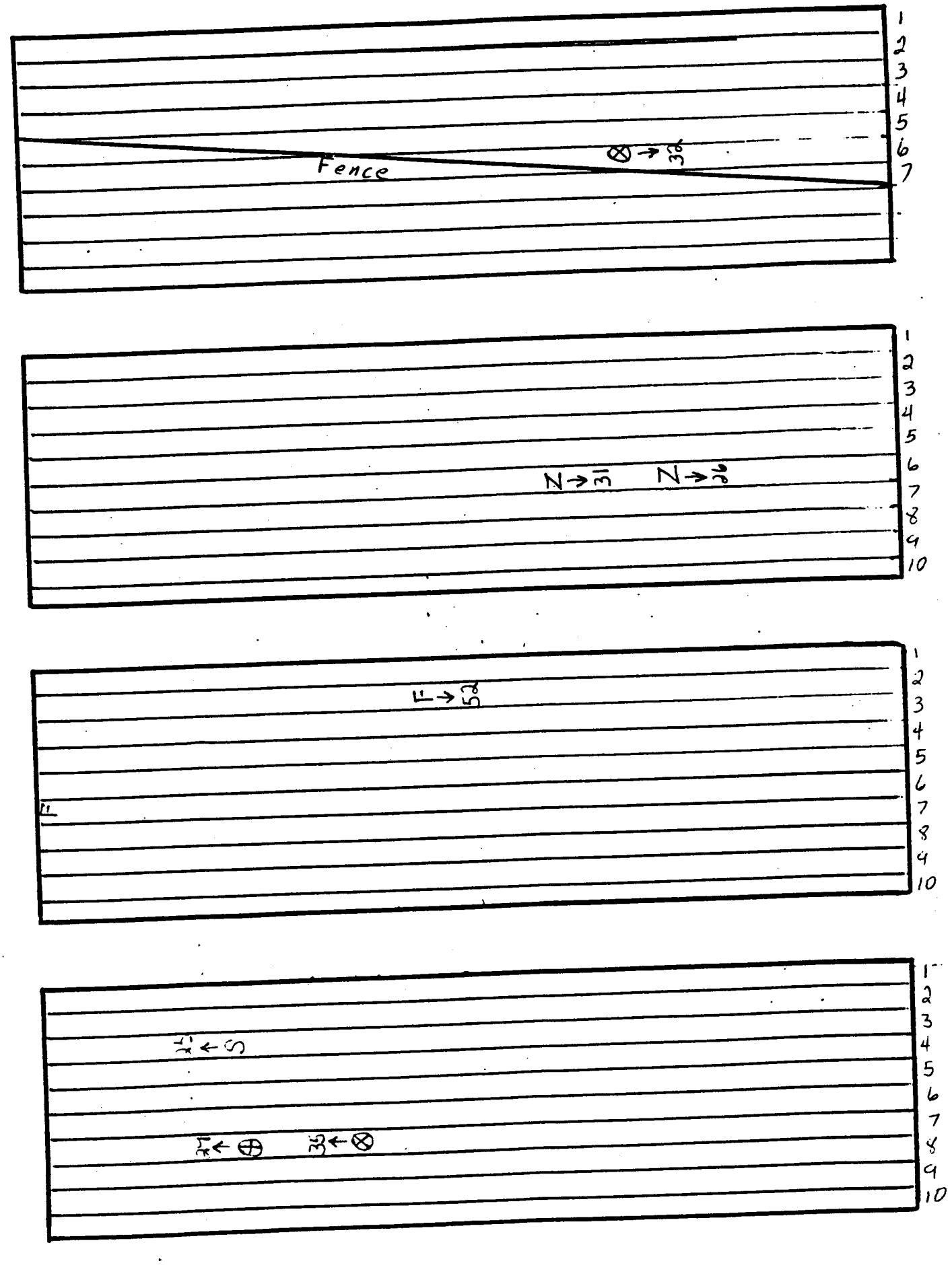
4710 WOODWAY FINDINGS MAP



4710 Woodway Plot Map



4710 Woodway Plot Map



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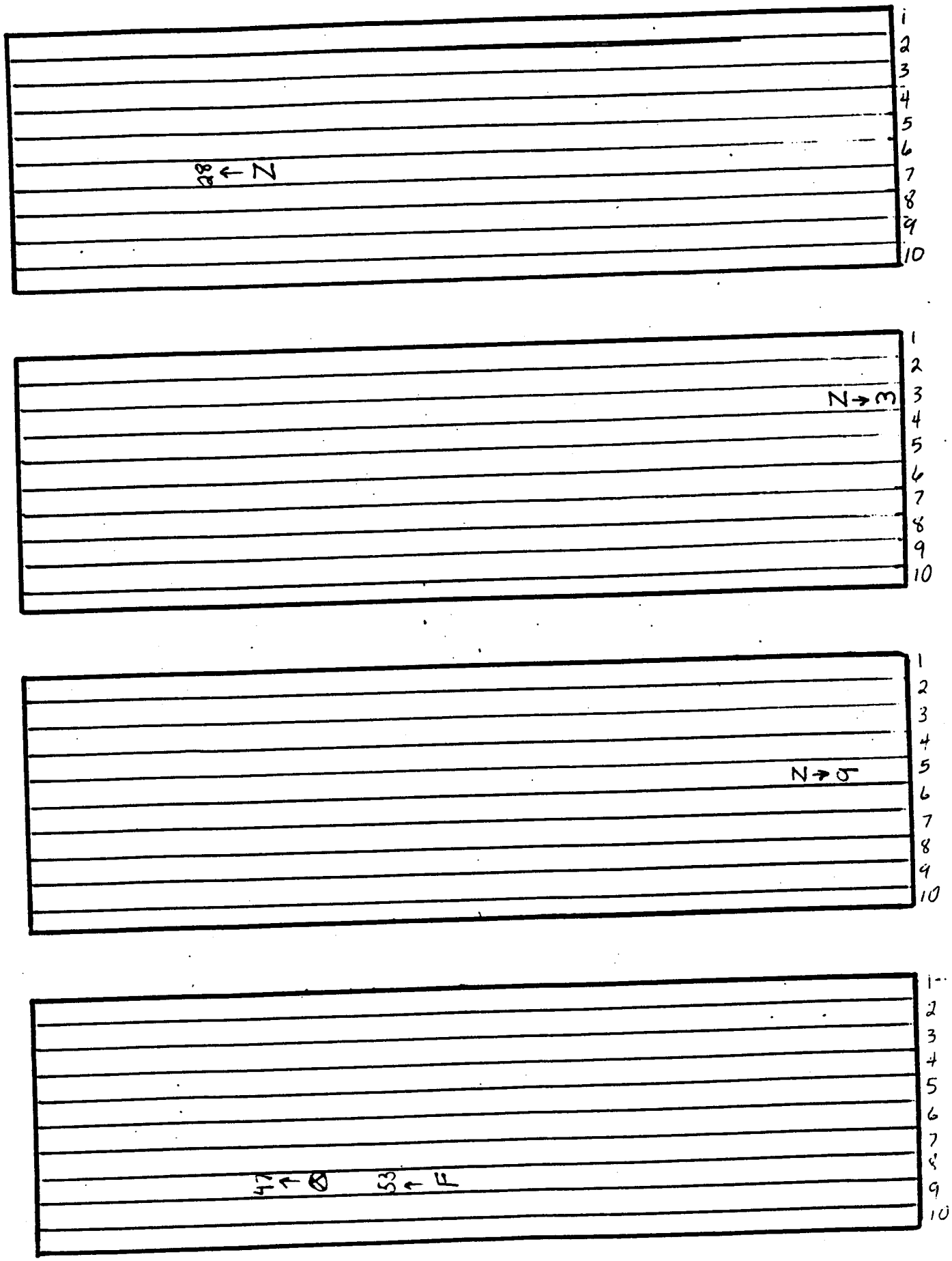

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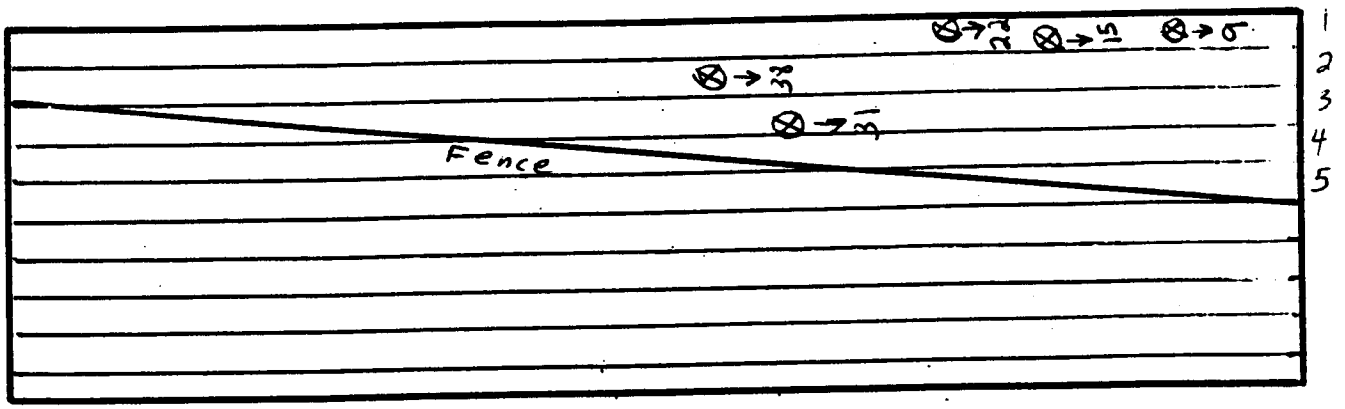

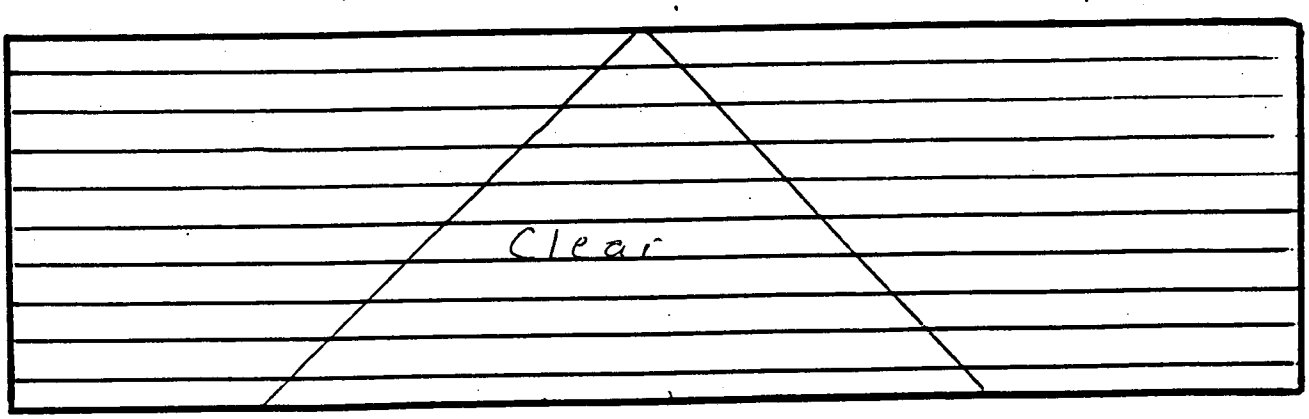

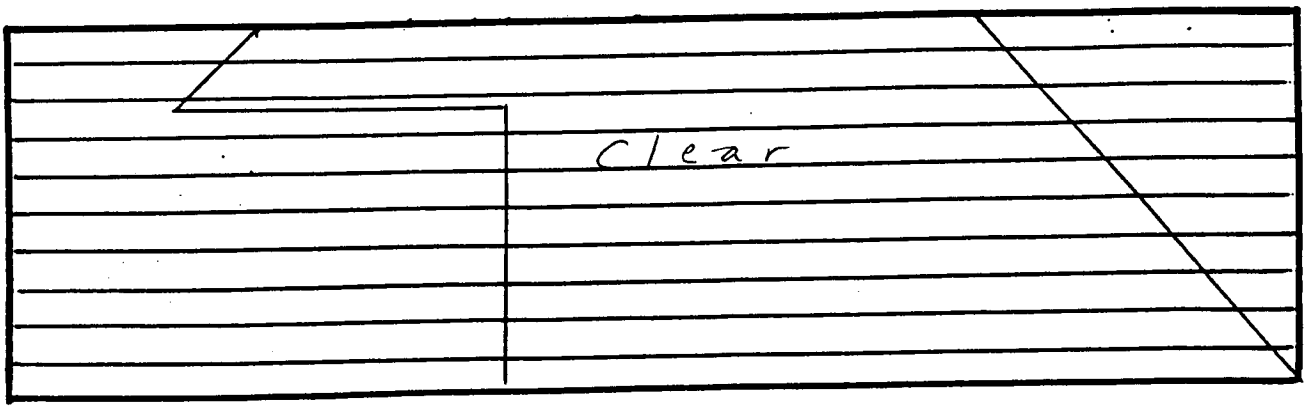

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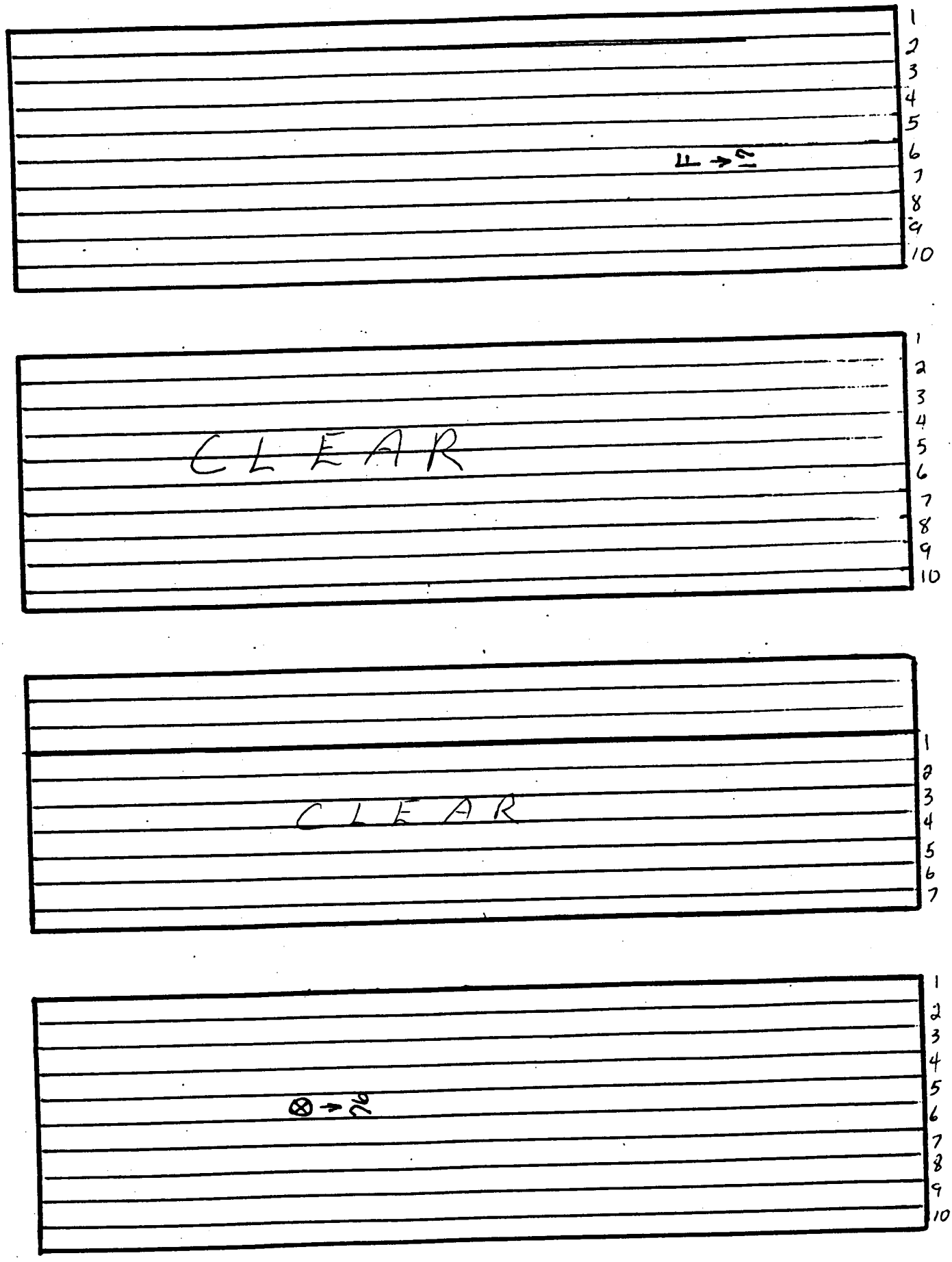
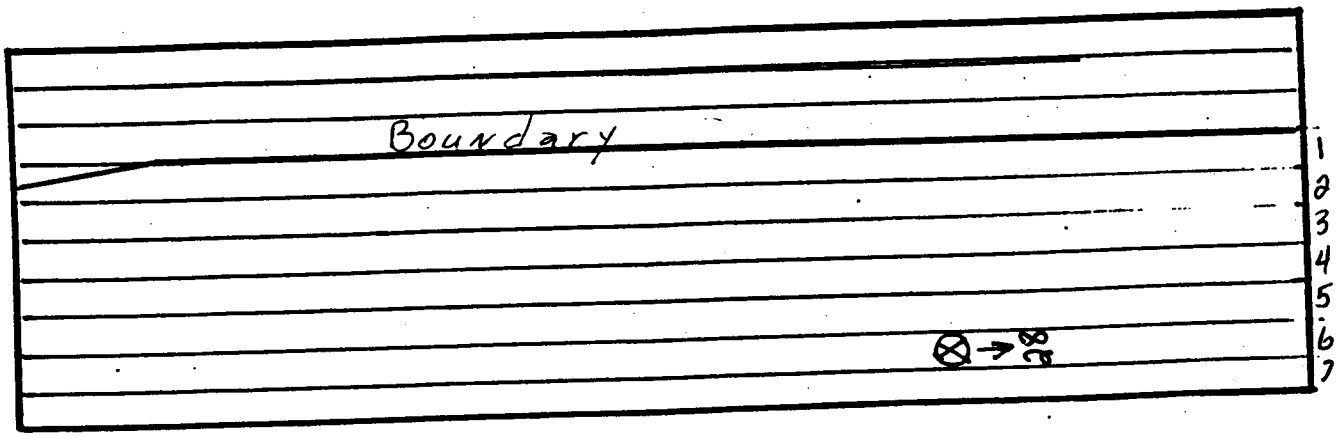


4710 Woodway Plot Map



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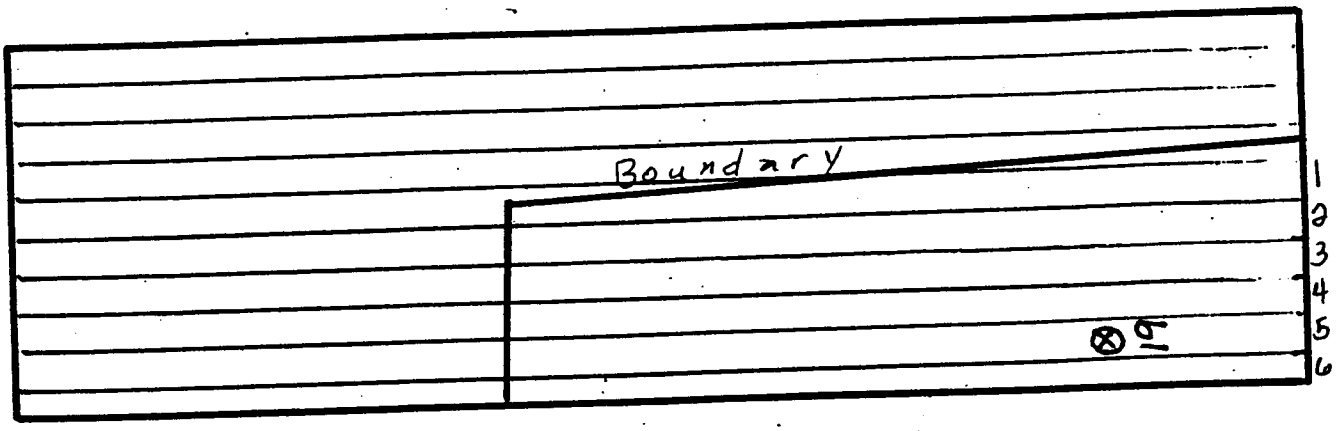

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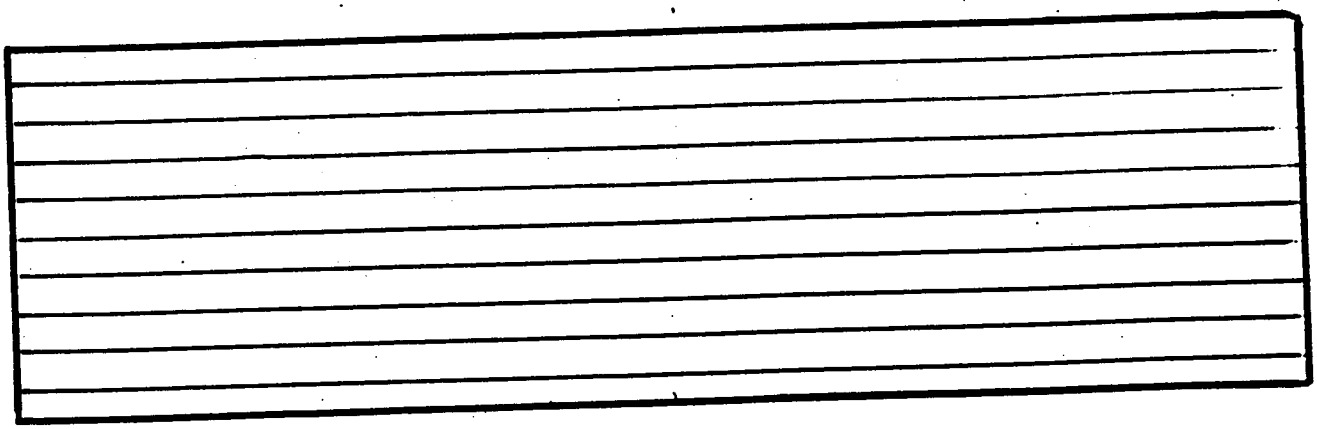
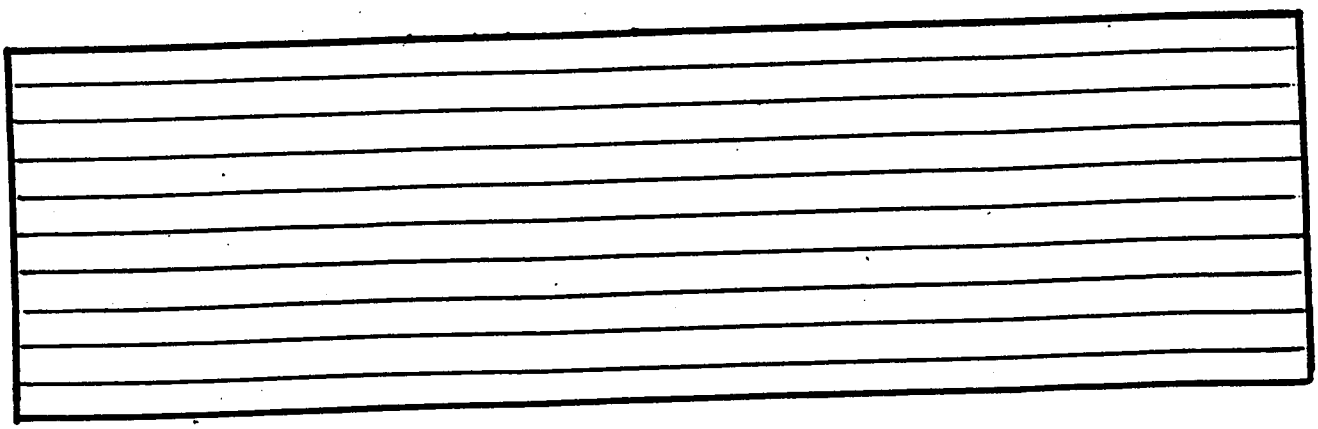




Attachment #2

CEHND-ED-SY-S (385-16b) 9 March 1994

MEMORANDUM FOR CEHND-ED-SY-S (Mr. Hank Hubbard)

SUBJECT: 4710 Woodway Street (Side Scan), Zone 4, Spring Valley Project

1. The enclosed report provides the Anomaly Review Board's (ARB) recommendation of no further action at the subject property. The anomalies in question associated with the side scan have been resolved as being associated with underground utilities.

2. The technical evaluation by the ARB of anomalies and the application of evacuation alternatives are consistent with the approved Spring Valley Safety Submission and the ARB Management Plan.

3. If you have any questions or require additional input from the ARB, you may contact me at 205-955-5785.

Encl

C. DAVID DOUTHAT, P.E., CSP
Chairperson, Anomaly Review Board

CF:
ED (Ron Lein) w/o Encl
PM (Leo Carden) w/o Encl
PM-OT (MCX Manager, Rob Wilcox) w/o Encl
CT-D (Dan Biggs/Mary Stringer) w/o Encl

MEMORANDUM

MARCH 1, 1994

TO: CHAIRPERSON, ANOMALY REVIEW BOARD, HUNTSVILLE DIVISION, HUNTSVILLE, AL

SUBJECT: **CEHND INVESTIGATION OF 4710 WOODWAY STREET (SIDE SCANS) SPRING VALLEY**

1. ON THIS DATE I INVESTIGATED THE ANOMALIES IDENTIFIED BY EOD TECHNOLOGY IN THE SIDE SCAN OPERATIONS ON THIS PROPERTY. THEY HAD SIDESCANNED 4 ANOMALIES (SEE ATTACHED SHEET). THERE ARE NO USRADS/DANS MAPS TO SHOW THE LOCATIONS OF THESE SIDESCAN LOCATIONS WITH ANY DEGREE OF RELIABILITY. THE LOCATIONS WERE IDENTIFIED BY RETURNING TO THE LOCATION AND FINDING THE REMAINS OF THE BOREHOLES USED AND LOCATING THE ANOMALY WITHIN THE CIRCLE CREATED BY THE BOREHOLES. MISS UTILITIES HAS MARKED AN EXISTING UNDERGROUND ELECTRICAL SERVICE LINE ON THE GROUND, WHICH IS INDICATED ON THE STRIP BY THE DASHED LINE. THIS IS A DUAL UNDERGROUND SERVICE LINE INDICATED BY PARALLEL LINES WITH DOTS IN BETWEEN AS DRAWN BY MISS UTILITIES ON THE GROUND.

A. SIDESCAN #4 LIES EITHER DIRECTLY OVER/UNDER THE ELECTRICAL LINE AS INDICATED BY MISS UTILITIES.

B. SIDESCAN #3, WAS A PIECE OF PIPE ABOUT 1 INCH IN DIAMETER BY 8 INCHES LONG AT 6 INCHES BELOW THE SURFACE LAYING HORIZONTAL TO THE SURFACE.

C. SIDESCAN #2 DUE TO ITS LOCATION TO THE ELECTRICAL LINE (ABOUT 2 FEET OFF THE LINE) AND EODT'S ESTIMATED SIZE OF THE ANOMALY (SEE ATTACHED SHEET FOR SITE 2), WAS NOT EXCAVATED.

D. SIDESCAN #1 WAS A PLOW SHARE AT BETWEEN 4 INCHES AND 9 INCHES BELOW THE SURFACE, ABOUT 1 1/2 POUNDS MASS OF METAL.

2. I USED THE STRIP MAP FABRICATED BY EOD TECHNOLOGIES AND THE EXISTING SURFACE OF THE GROUND TO LOCATE AND IDENTIFY THE SIDESCAN LOCATIONS.

3. I USED THE SCHONDSTEDT GA-72 MAGNETOMETER TO LOCATE THE ANOMALIES.

4. BASED ON THE ABOVE, I RECOMMEND THE FOLLOWING:

A. DISMISS THE ANOMALY IDENTIFIED BY EODT AT SIDESCAN #4 DUE TO IT'S POSITION TO THE ELECTRICAL LINE.

B. DISMISS THE ANOMALY IDENTIFIED BY EODT AT SIDESCAN #3.

C. DISMISS THE ANOMALY IDENTIFIED BY EODT AT SIDESCAN #2 DUE TO ITS POSITION TO THE ELETRICAL LINE AND ITS ESTIMATED SIZE.

D. DISMISS THE ANOMALY IDENTIFIED BY EODT AT SIDESCAN #1.

5. INVESTIGATION WAS CONDUCTED IAW SOP, QUALITY ASSURANCE/FOLLOW-ON INVESTIGATION OF SPRING VALLEY PROPERTIES BY CEHND PERSONNEL, DATED 20 JAN 94.

HENRY C. HUBBARD JR.
SAFETY SPECIALIST
HUNTSVILLE DIVISION
SPRING VALLEY RESIDENT OFFICE
WASHINGTON, DC

1ST ENDORSEMENT 1 MAR 94

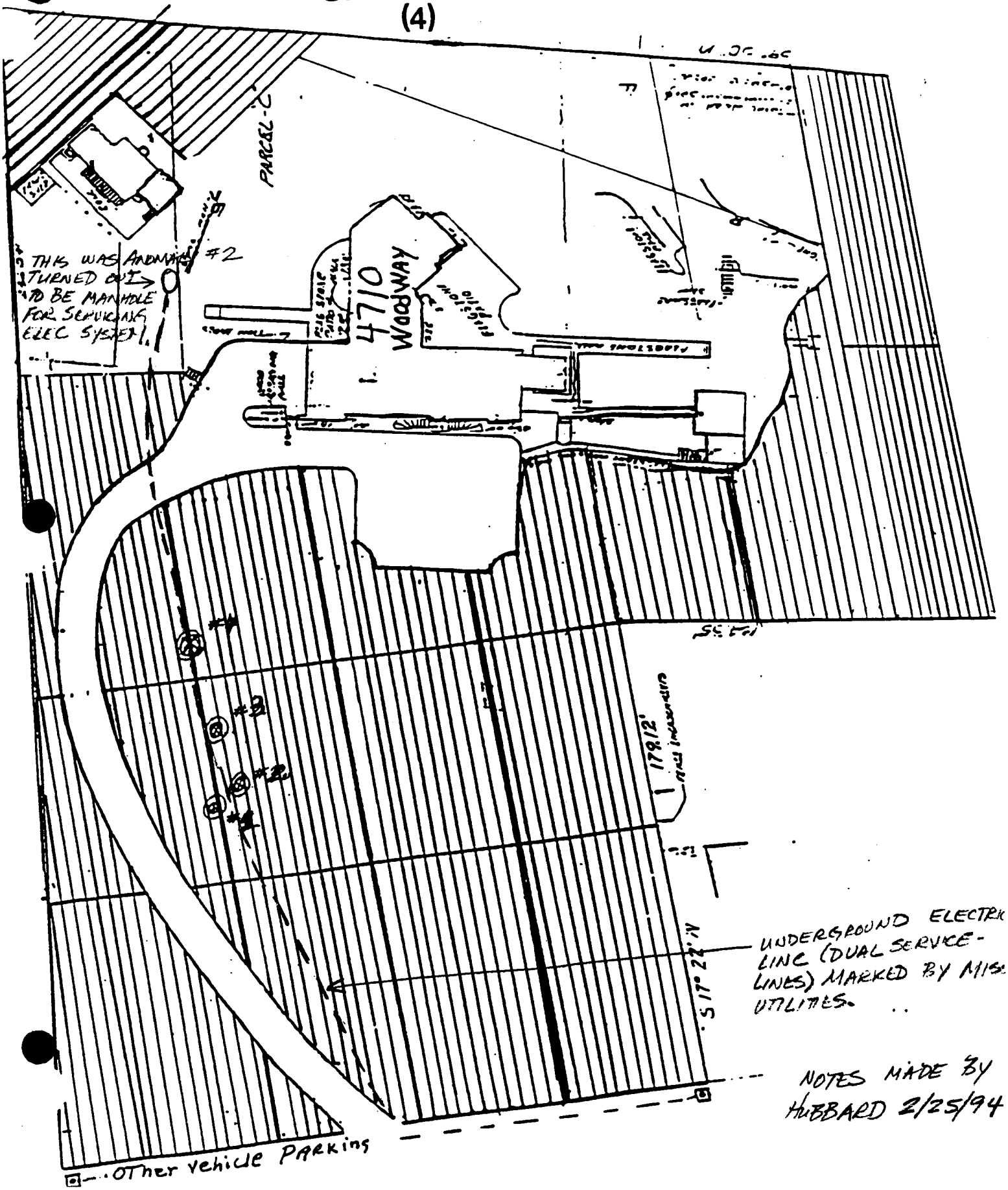
BASED ON THE SITE INSPECTION PERFORMED BY MR. HUBBARD AND THE PHYSICAL EVIDENCE PROVIDED TO THE BOARD, THE ARB CONCURS WITH THE RECOMMENDATION.

C. DAVID DOUTHAT
CHAIRPERSON
ANOMALY REVIEW BOARD

CF:
GLENN EARHART, RESIDENT ENGINEER, SVRO

FILE: INVES\4710WOOS

4710 WOODWAY LN
SIDE SCAN
(4)

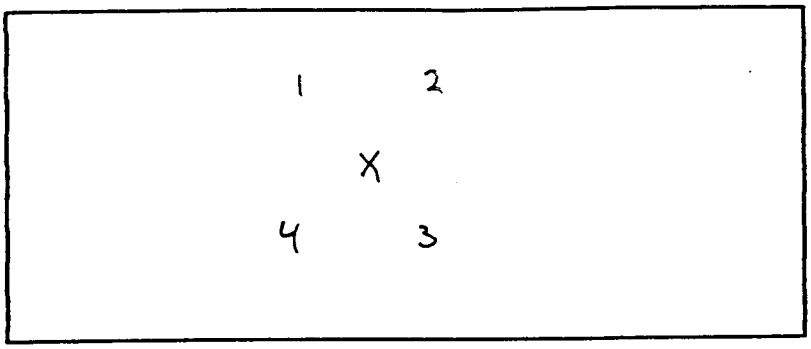


4710 WOODWAY 8/18/93

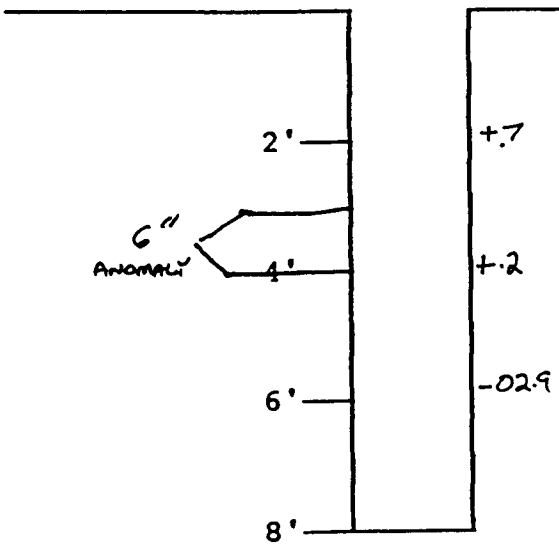
ANOMALY #1

SIDE SCAN BORING/ANOMALY LOCATION GRAPH

ABOVE GROUND DRAWING



HOLE 1



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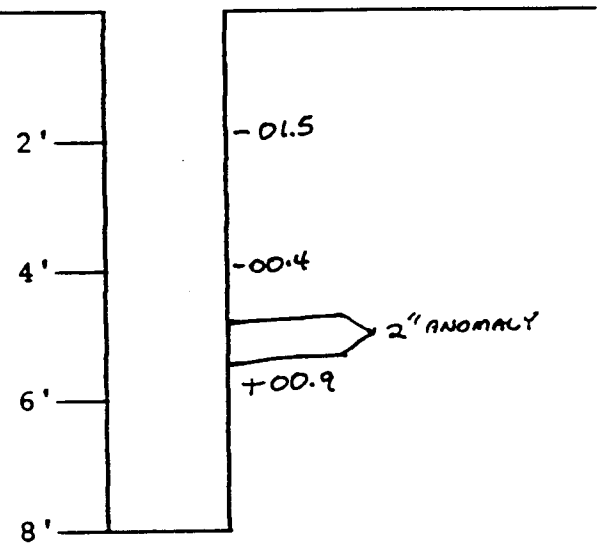

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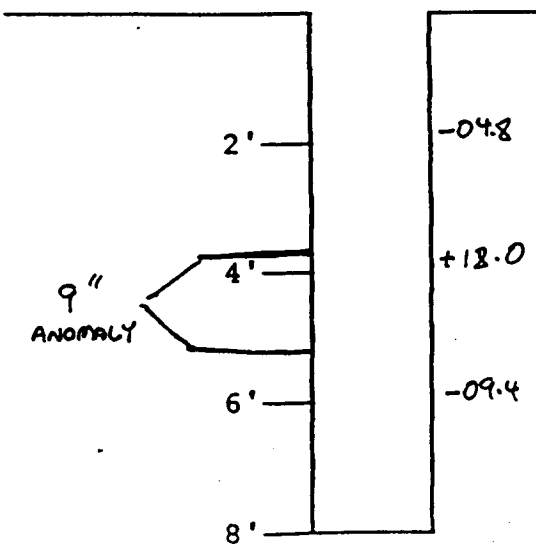

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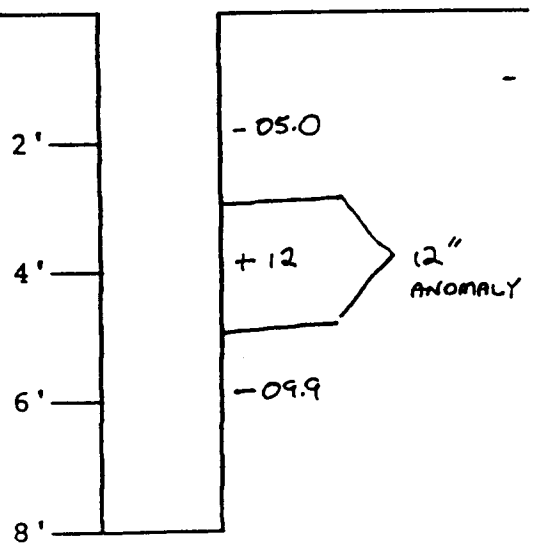
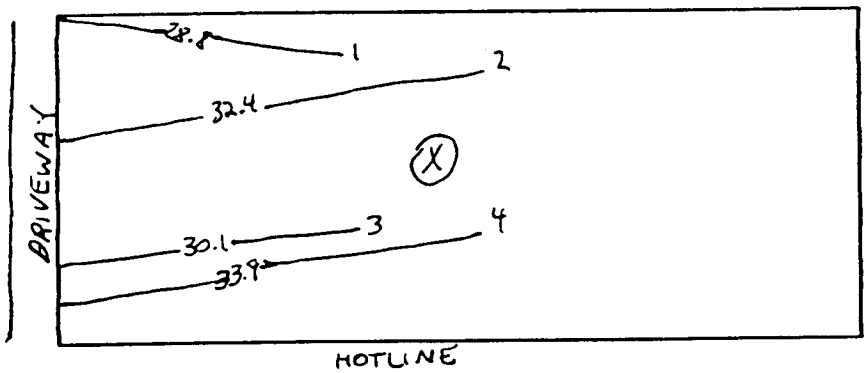


SIDE SCAN BORING/ANOMALY LOCATION GRAPH

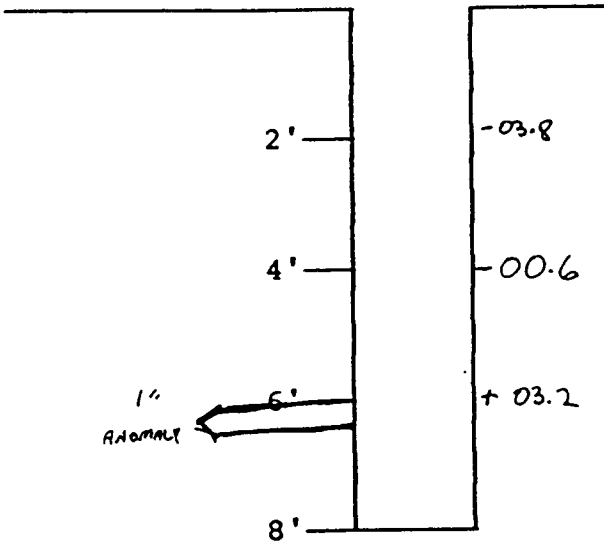
ADDRESS 4710 WOODWAY DATE 8-18-19-1993

SITE 2

ABOVE GROUND DRAWING



HOLE 1



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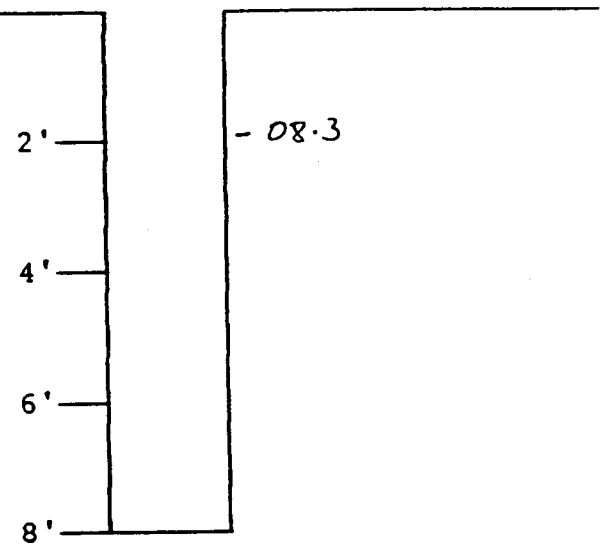

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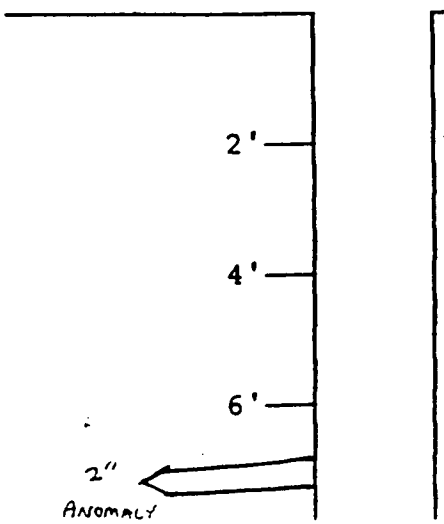
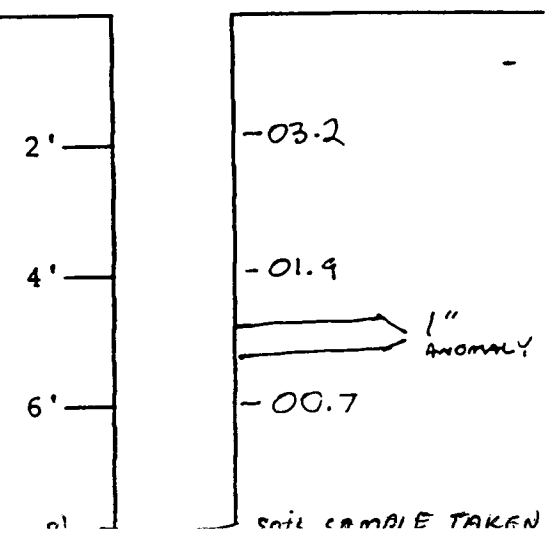


HOLE 4

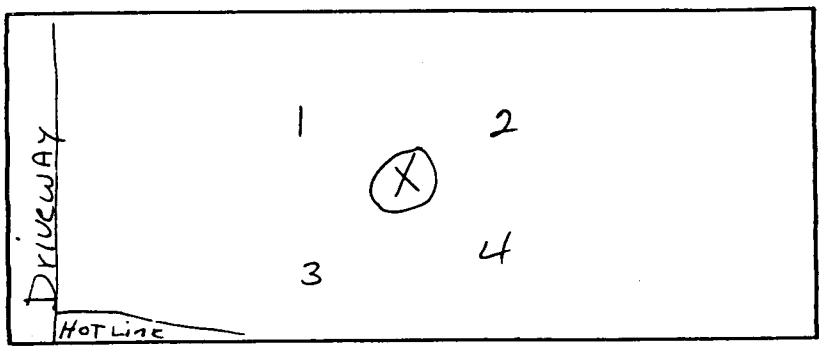


SIDE SCAN BORING/ANOMALY LOCATION GRAPH

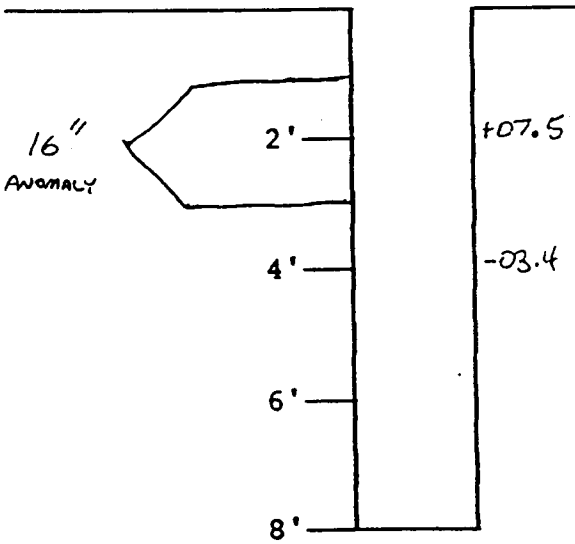
ADDRESS 4710 WOODWAY DATE 8-19-93

ANOMALY 3+

ABOVE GROUND DRAWING



HOLE 1



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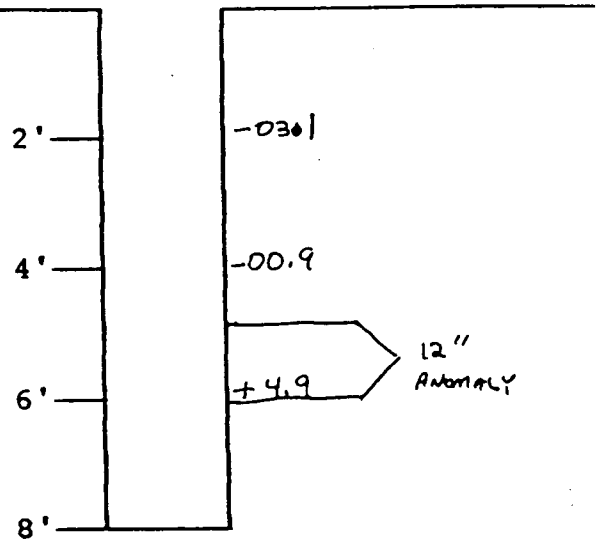

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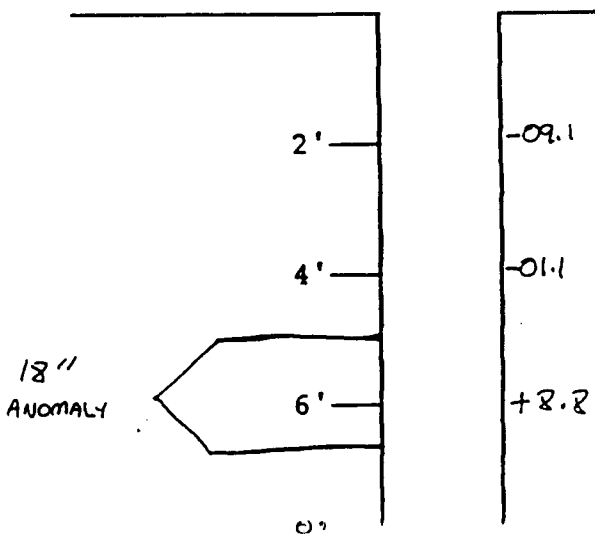
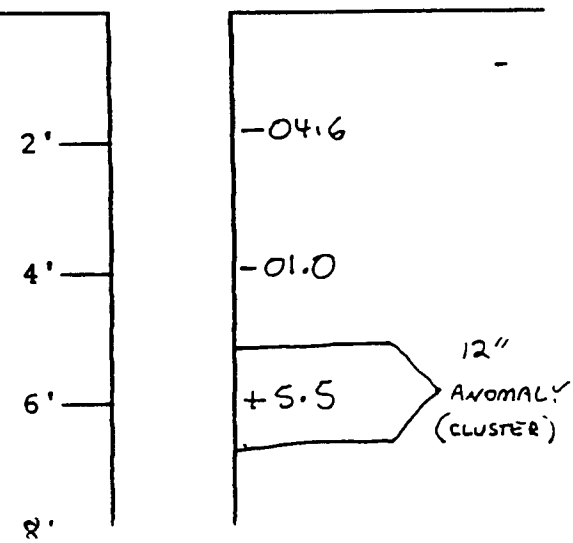


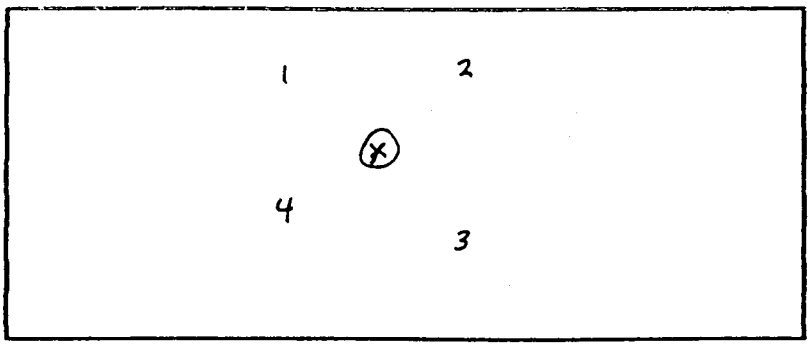
HOLE 4

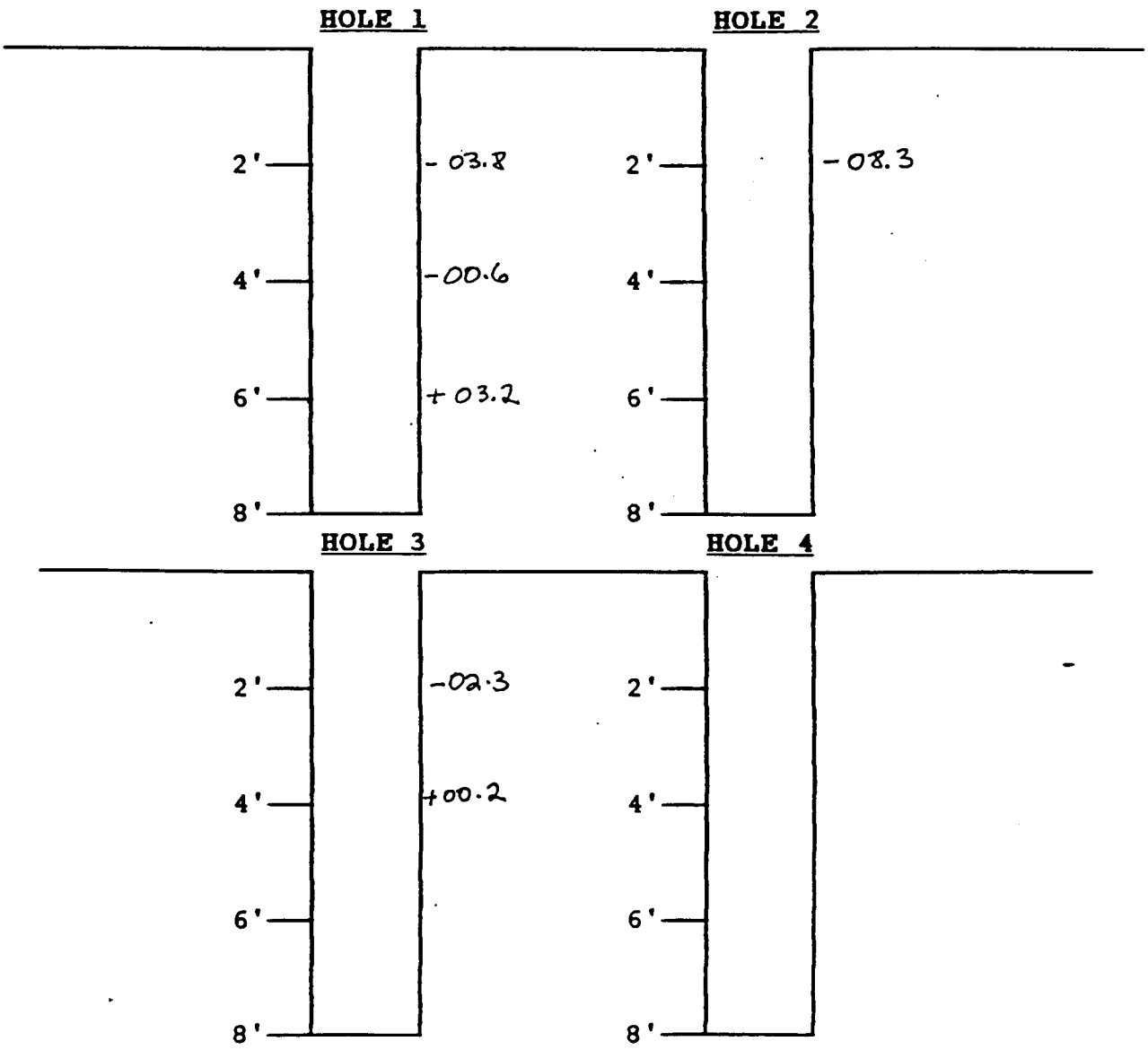


SIDE SCAN BORING/ANOMALY LOCATION GRAPH

ADDRESS 4710 WOODWAY DATE 8-18-93

ABOVE GROUND DRAWING





BORING/ SIDE SCAN OPERATION
OF 4710 WOODWAY LANE
ZONE 4
SEPT 11, 1993

This report is for work performed between July 12, 1993 and August 23, 1993.

Survey of the property of 4710 Woodway Lane, prepared by the DANS unit of EODT Services Inc., revealed numerous anomalies and ground disturbances; also, on this property are two of the smoke test chambers used during the time between 1917 and 1919. It was felt that given the history of this portion of the former U.S. Army/American University Chemical test Site,"now privately owned". Seven anomalies found were chosen to be side scanned to see if they could be ordnance or ordnance related items. Soil samples would be taken from the smoke test chambers, at the same time. Also It was decided bore samples should be taken from thirty nine different sites carefully selected throughout the front portion of the property.

The United States Army Corp of Engineers (USACE), authorized EOD Technology Inc. to perform thirty nine boring, each to a depth of six feet, a sample of soil was taken from the bottom of the hole the hole was then filled back in. The sample was immediately turned over to the RTAP personnel for real time analysis. The USACE also authorized collection of soil from the inter chamber of the smoke test bunkers, for sampling, and the side scanning of those seven anomalies which looked the a possible trench.

Work began on the morning of 12 July 1993. Once all vehicles and instrumentation was in place the boring began. Seven holes were bored the first day. Eleven holes were bored on the 13th and on the refilling of the number eight hole a little bottle with an unknown liquid in it was discovered. The bottle was double bagged and turned over to the TEU personnel for analysis at Aberdeen. Boring was not done on the 14th, for it had been decided to do the soil sampling on the smoke test chambers(2). Boring began again on the 15th and seven holes were completed. Work on 4710 Woodway stopped from the evening of the 15th of July and began on 17 August. Seven holes were bored no the 17th,and on the 18th set up was completed, before Col Crotteau USACENAB came to the site and said he wanted all boring operation to cease. At that time crew turned to side scan. 18,19,and 20 August was spent side scanning four of the seven anomalies. 21 and 22 August were a weekend. 23 August all equipment in place work began. At 0940 23 August 1993 we found out that a positive arsenical reading had been received on the 19th of August between 1300 and 1610. Based on this information, Henry Hubbard, the USACEHND Safety representative stopped all operation until further notice.

Attachment #3

CEHND-ED-SY-S (385-16b) 15 February 1994

MEMORANDUM FOR CEHND-ED-SY-S (Mr. Hank Hubbard)

SUBJECT: 4710 Woodway Street, Zone 4, Spring Valley Project

1. The enclosed report provides the Anomaly Review Board's (ARB) recommendation of further investigation or excavation at the subject property. The information provided (see enclosure) to the ARB did not resolve this anomaly.

2. The technical evaluation by the ARB of anomalies and the application of evacuation alternatives are consistent with the approved Spring Valley Safety Submission and the ARB Management Plan.

3. If you have any questions or require additional input from the ARB, you may contact me at 205-955-5785.

Encl

C. DAVID DOUTHAT, P.E., CSP
Chairperson, Anomaly Review Board

CF:
ED (Ron Lein) w/o Encl
PM (Leo Carden) w/o Encl
PM-OT (MCX Manager, Rob Wilcox) w/o Encl
CT-D (Dan Biggs/Mary Stringer) w/o Encl

MEMORANDUM

FEBRUARY 7, 1994

TO: CHAIRPERSON, ANOMALY REVIEW BOARD, HUNTSVILLE DIVISION, HUNTSVILLE, AL

SUBJECT: **CEHND INVESTIGATION OF 4710 WOODWAY STREET, SPRING VALLEY**

1. ON THIS DATE I INVESTIGATED THE ANOMALIES IDENTIFIED BY THE ANOMALY REVIEW BOARD AS CANDIDATES FOR EXCAVATION FOR THE SUBJECT PROPERTY WITH THE FOLLOWING RESULTS:

A. ANOMALY #1 WAS NOT COMPLETELY IDENTIFIED. WITHIN THE FIRST MINUTE I HAD LOCATED 6 LARGE MAGNETIC ROCKS OVER A LARGE AREA, ABOUT 10 FEET IN DIAMETER. I DID NOT EXCAVATE ON THIS SITE DUE TO THE LARGE NUMBER OF MAGNETIC HITS.

2. I USED THE "IN-PHASE" & "QUADRATURE MAPS" PRODUCED BY EODT SERVICES TO LOCATE THE ANOMALIES' LOCATION.

3. I USED THE SCHONDSTEDT GA-72 MAGNETOMETER TO LOCATE THE ANOMALIES.

4. BASED ON THE ABOVE, I RECOMMEND THE FOLLOWING:

A. PERFORM A DANS LEVEL 4 INVESTIGATION ON THIS SITE, PRIOR TO EXCAVATING.

5. INVESTIGATION WAS CONDUCTED IAW SOP, QUALITY ASSURANCE/FOLLOW-ON INVESTIGATION OF SPRING VALLEY PROPERTIES BY CEHND PERSONNEL, DATED 20 JAN 94.

HENRY C. HUBBARD JR.
SAFETY SPECIALIST
HUNTSVILLE DIVISION
SPRING VALLEY RESIDENT OFFICE
WASHINGTON, DC

1ST ENDORSEMENT 10 FEB 94

BASED ON THE SITE INSPECTION PERFORMED BY MR. HUBBARD AND THE PHYSICAL EVIDENCE PROVIDED TO THE BOARD, THE ARB CONCURS WITH THE RECOMMENDATION TO EXCAVATE. THE ARB DOES NOT CONCUR IN APPLYING DANS LEVEL 4 TECHNOLOGY TO THIS SITE.

C. DAVID DOUTHAT
CHAIRPERSON
ANOMALY REVIEW BOARD

CF:
GLENN EARHART, RESIDENT ENGINEER, SVRO

FILE: INVES\4710WOOD

CEHND-ED-SY (385-16b) 15 October 1993

MEMORANDUM FOR PM-OT (Mr. Stan Lee)

SUBJECT: 4710 Woodway Street, Zone 4, Spring Valley Project

1. The enclosed report provides the Anomaly Review Board's (ARB) recommendation for excavation of anomaly(s) at the subject property. In addition, a recommended alternative 3 is provided for evacuation of Spring Valley residents during the excavation activities.

2. The technical evaluation by the ARB of anomalies and the application of evacuation alternatives are consistent with the approved Spring Valley Safety Submission and the ARB Management Plan.

3. If you have any questions or require additional input from the ARB, you may contact me at 205-955-5785.

C. DAVID DOUTHAT, P.E., CSP
Chairperson, Anomaly Review Board

Encl

CF:
ED (Ron Lein) w/o Encl
PM (Leo Carden) w/o Encl
PM-OT (MCX Manager, Rob Wilcox) w/o Encl
CT-D (Dan Biggs/Mary Stringer) w/o Encl

MEMORANDUM

30 SEP 93

TO: CHAIRPERSON, ANOMALY REVIEW BOARD, HUNTSVILLE DIVISION

SUBJECT: 4710 WOODWAY STREET, ZONE 4, SPRING VALLEY PROJECT

1. KNOWN DATA:

A. ANOMALIES ARE ON PROPERTY WHICH IS LOCATED ON, IN, AND SURROUNDED BY POINTS OF INTEREST #21, 22, 23, & 25.
B. SIDE SCANS WERE PERFORMED AND INDICATED THE PRESENCE OF ANOMALIES.
C. PROPERTY IS LOCATED WITHIN CUT/FILL INDICATED ON THE CRITERIA SHEET.
D. THERE IS EVIDENCE OF KNOWN/SUSPECT CONSTRUCTION SITES.
E. ANOMALY #1 IS LOCATED NEAR KNOWN UTILITY LINES (UNDERGROUND).
G. SCHONDSTEDT READINGS WERE ALL +10 ON THE 10 SCALE AT GROUND LEVEL AND 10 AT BETWEEN 12" AND 18" ABOVE THE GROUND. ESTIMATED SIZE OF ANOMALY #1 IS 6 FT x 2 FT, ANOMALY #2 IS 6 FT x 2 FT.
I. QUAD MAP DOES SHOWS VERY CONCENTRATED GROUND DISTURBANCE AT BOTH ANOMALIES' LOCATION.

2. SAFETY SUBMISSION CONSIDERATIONS:

A. THE ANOMALIES, #1 OR #2, COULD BE A PIT/TRENCH BASED UPON ANALYSIS OF EM31 QUAD AND IN-PHASE MAPS.
B. HISTORICAL DATA DOES INDICATE THE AREA WAS USED EXTENSIVELY FOR TESTING PURPOSES.
C. THIS AREA COULD CONCEIVABLY BE CONSIDERED A KNOWN PIT/TRENCH/IMPACT AREA.

3. ASSUMPTIONS:

A. HISTORICAL DATA IS ACCURATE.
B. CUT & FILL MAP IS FAIRLY ACCURATE.
C. EM 31 CORRECTLY INTERPRETED GROUND DISTURBANCE.
D. MAGNETOMETER READINGS AND INDICATIONS ARE ACCURATE.

4. RECOMMENDATIONS: EXCAVATE UNDER THE GUIDELINES OF ALTERNATIVE 3.

HENRY C. HUBBARD JR.
CEHND-ED-SY
SAFETY SPECIALIST
SPRING VALLEY RESIDENT OFFICE

1ST ENDORSEMENT

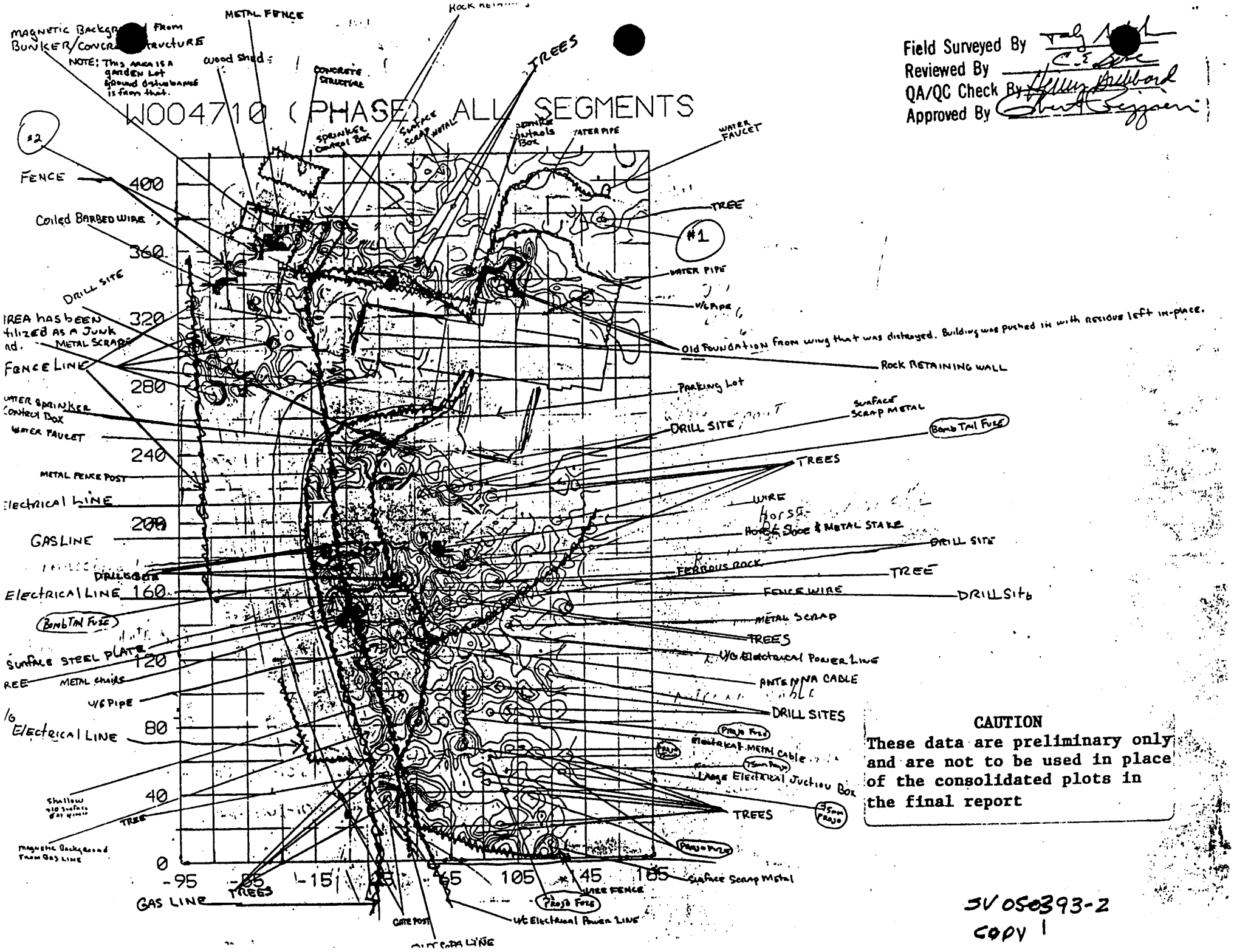
THE ANOMALY REVIEW BOARD HAS REVIEWED THE PACKET PERTINENT TO THE PROPERTY IDENTIFIED AND NOTED THE TECHNICAL RECOMMENDATION.

THE ANOMALY REVIEW BOARD CONCURS WITH THE TECHNICAL RECOMMENDATION HEREIN AND ENDORSES EXCAVATION UNDER ALTERNATIVE 3.

C. DAVID DOUTHAT
CHAIRPERSON
ANOMALY REVIEW BOARD

13 Oct 93

FILE: WPARBFI\4710WOOD



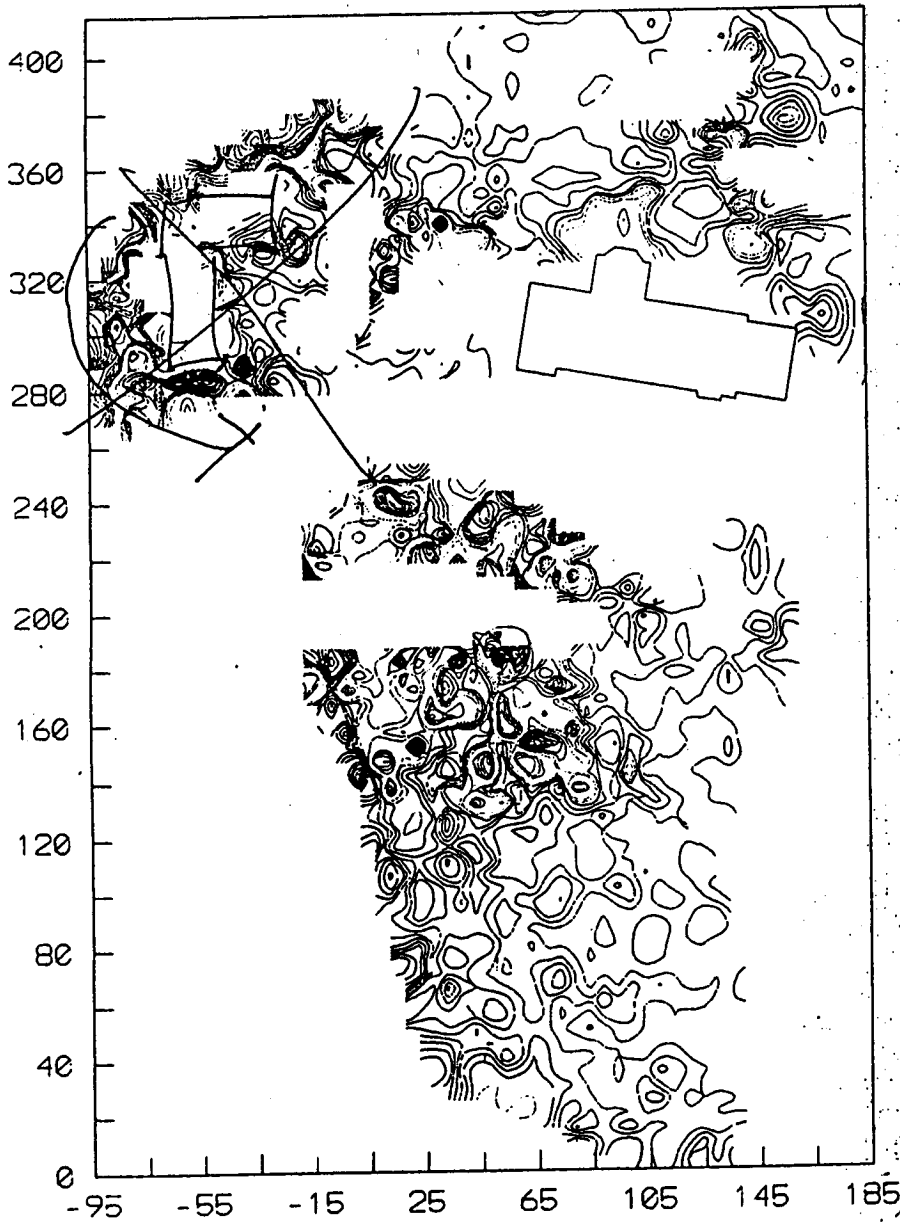
Field Surveyed By
Reviewed By
QA/QC Check By
Approved By

CAUTION
These data are preliminary only and are not to be used in place of the consolidated plots in the final report

JV050393-2
COPY 1

Field Surveyed By
Reviewed By
QA/QC Check By
Approved By

W004710 (QUAD) ALL SEGMENTS



65 radians

Center

.16' grid

CAUTION
These data are preliminary only and are not to be used in place of the consolidated plots in the final report

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Cy. #1

CAUTION
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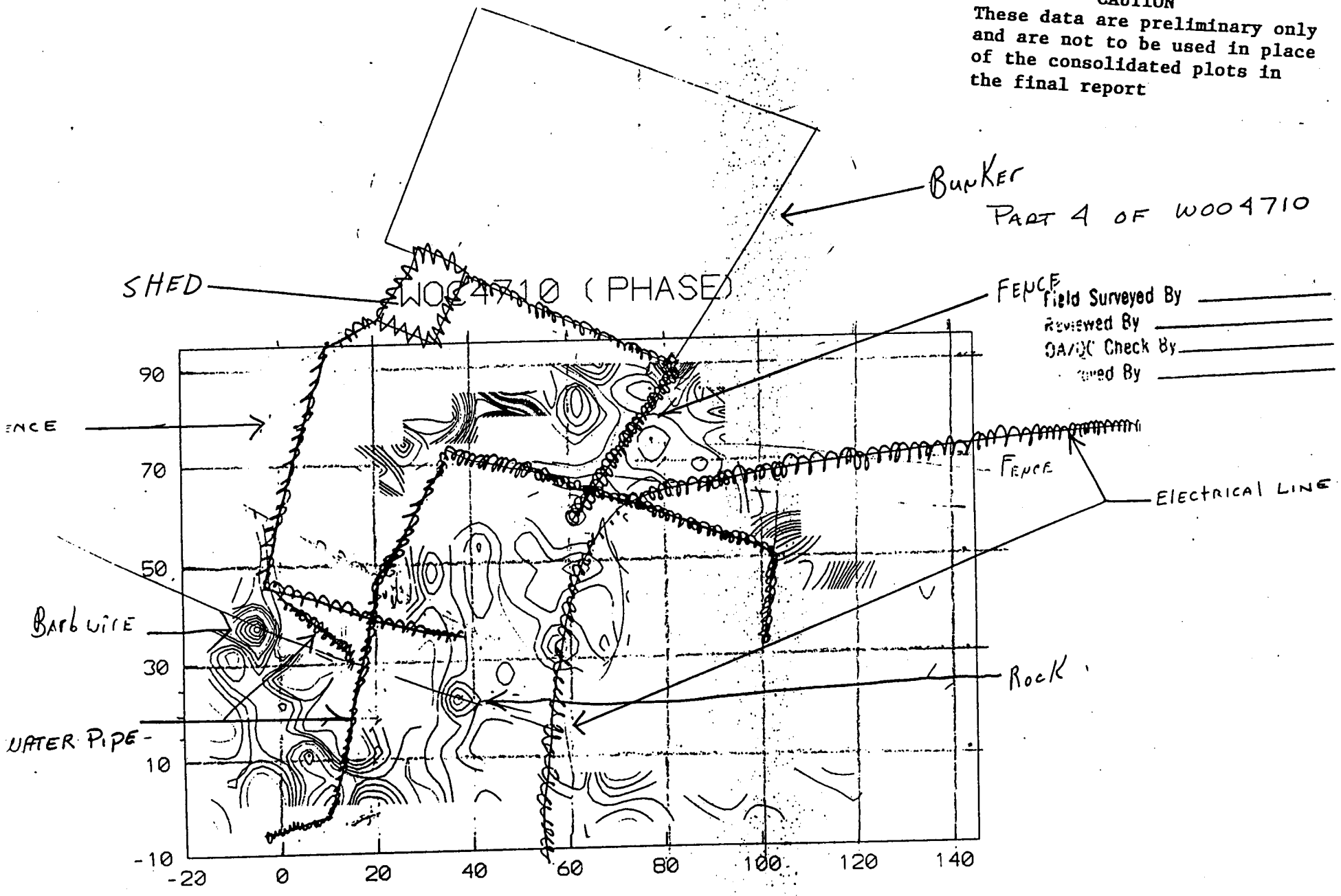

CAUTION
This plot is preliminary and is not to be used in place of the consolidated plots in the final report

WOD4710 PHASE 06/15

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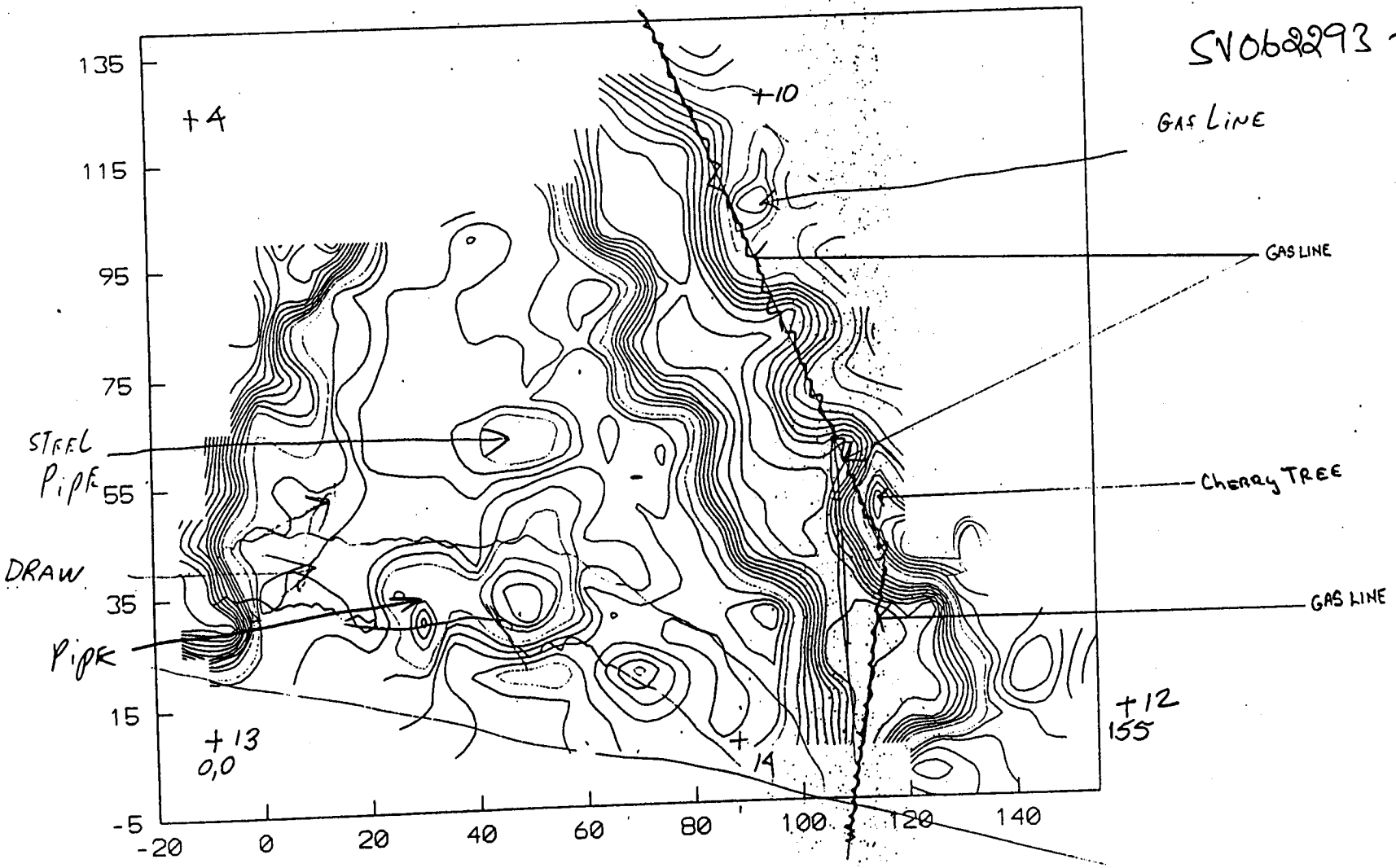
SV062293 – 24



CAUTION
This plot is preliminary and is not to be used in place of the consolidated plots in the final report

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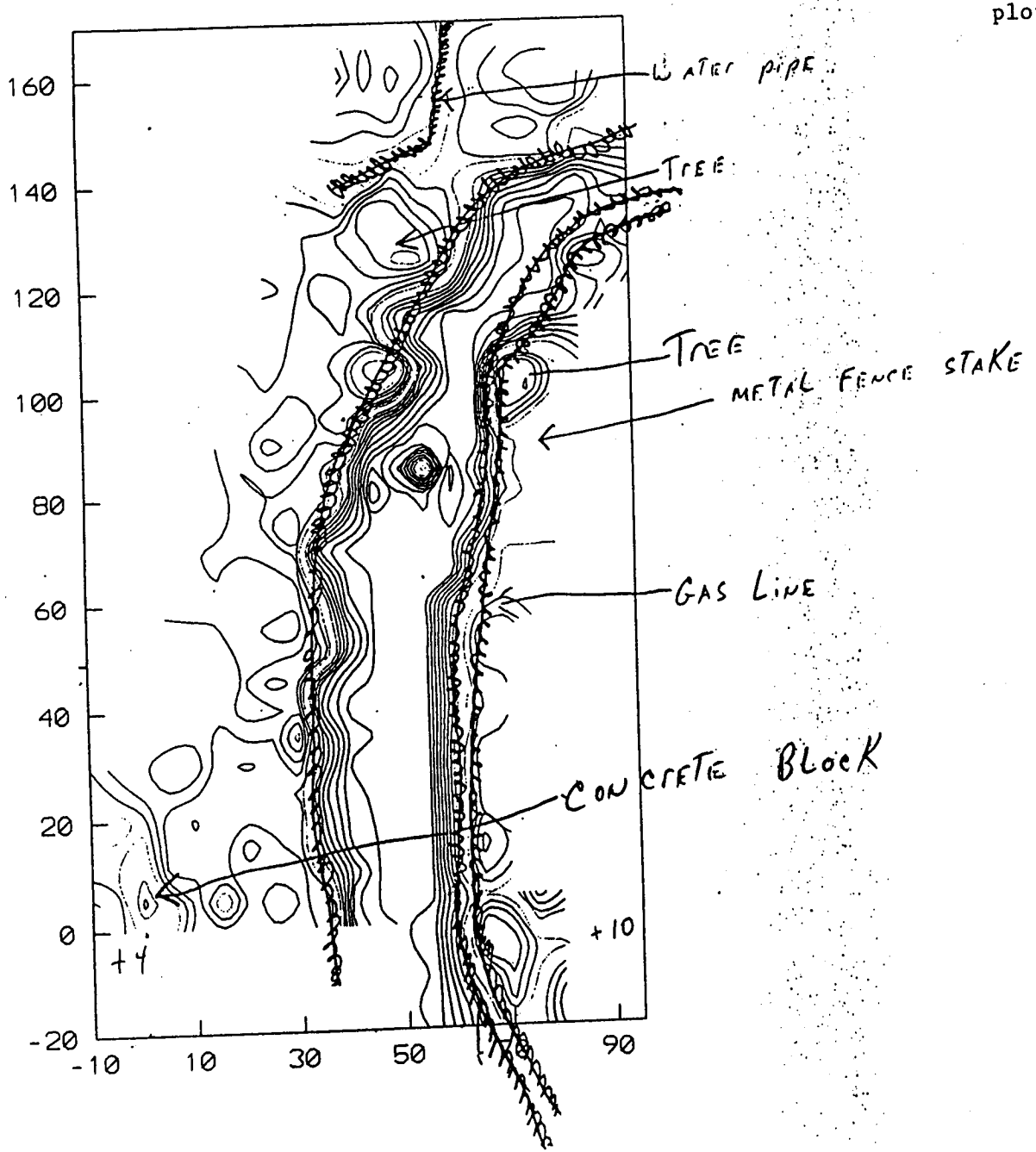
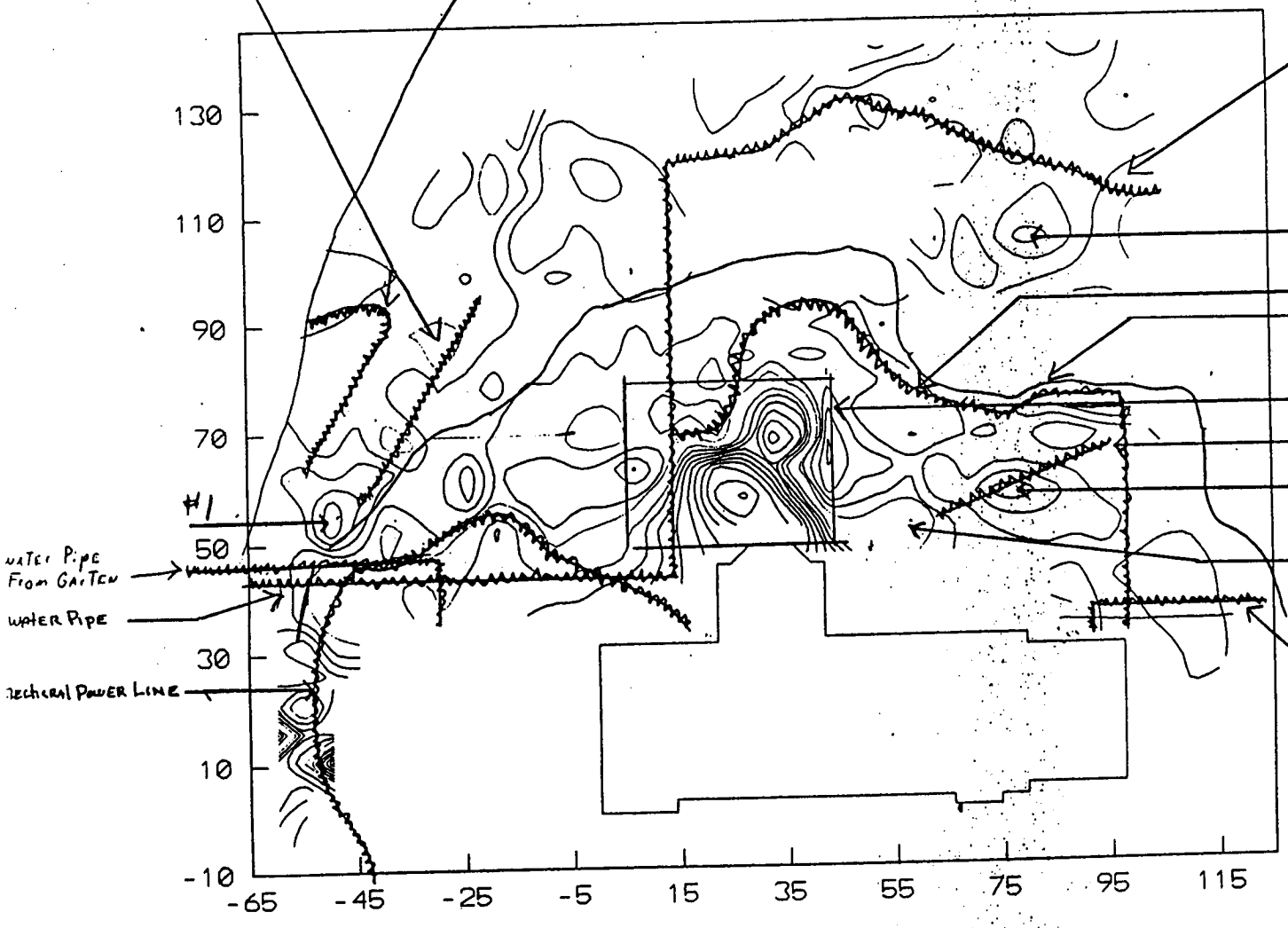
SV062893-2b

WOE4710 PHASE 06/15



Field Surveyed By _____
Reviewed By _____
QA/QC Check By _____
Approved By _____

W004710 (PHASE) HOUSE SEGMENT



CAUTION
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SV050393-9
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cy. #1

CAUTION
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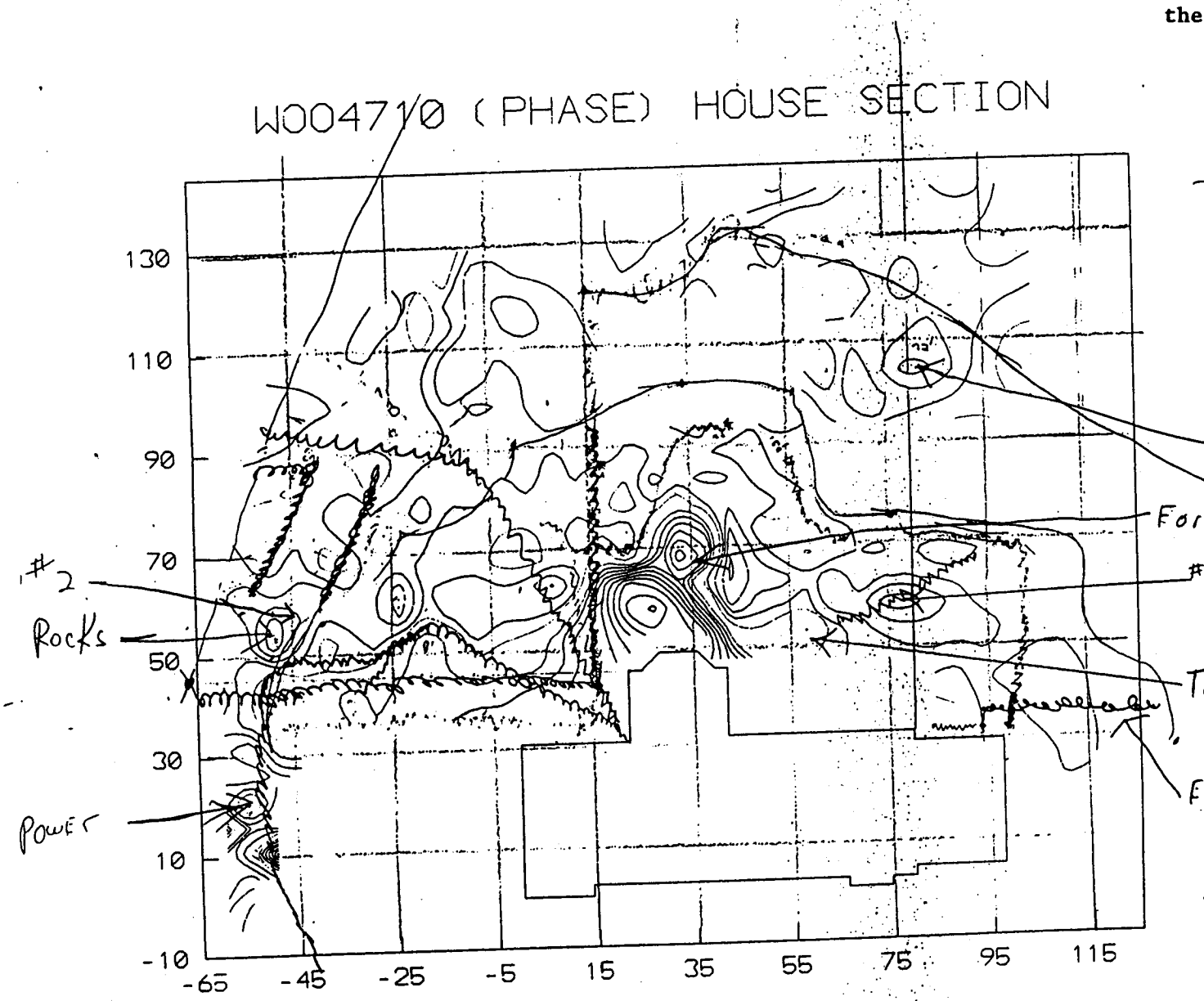
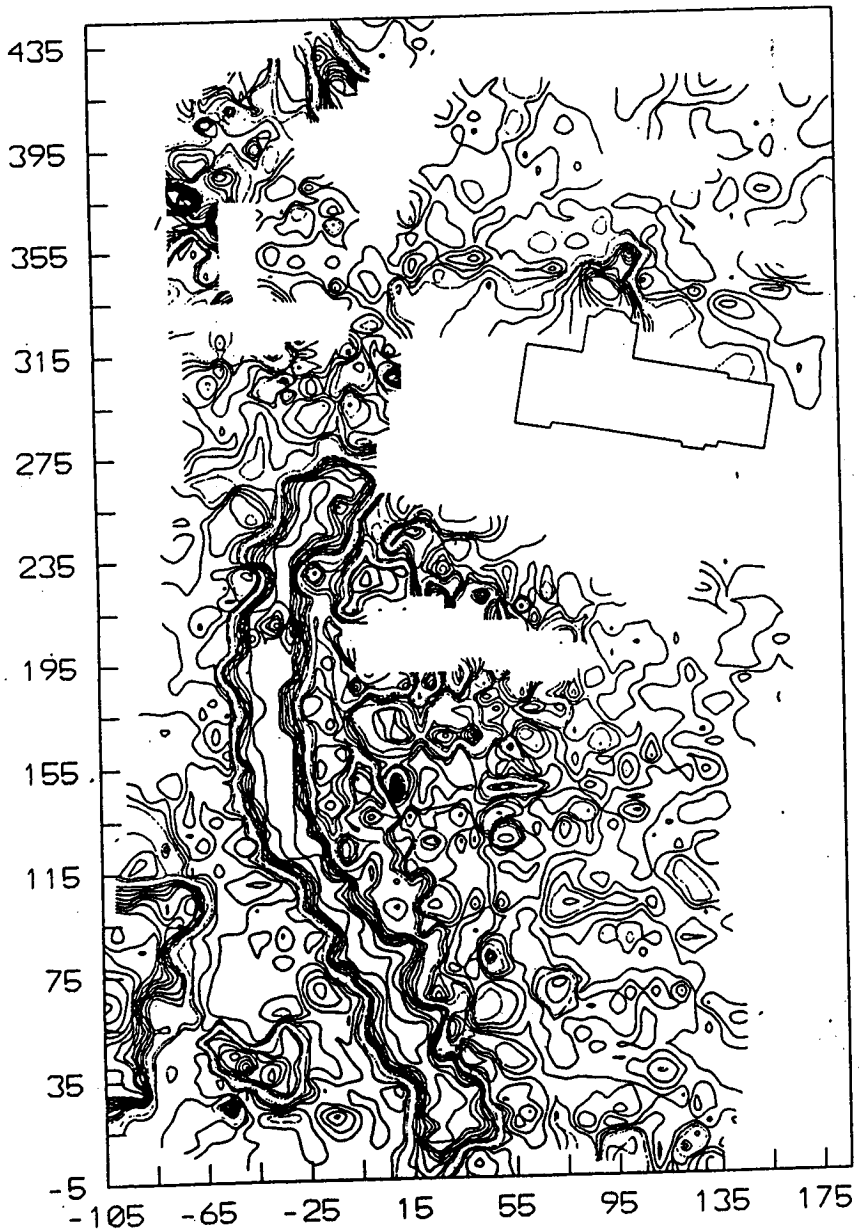


PART 3 OF W004710

Field Surveyed By _____
Reviewed By _____
QA/QC Check By _____
Approved By _____

W004710 COMPOSITE (PHASE) 7/7/93



CAUTION
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SV0709-93-3
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CAUTION
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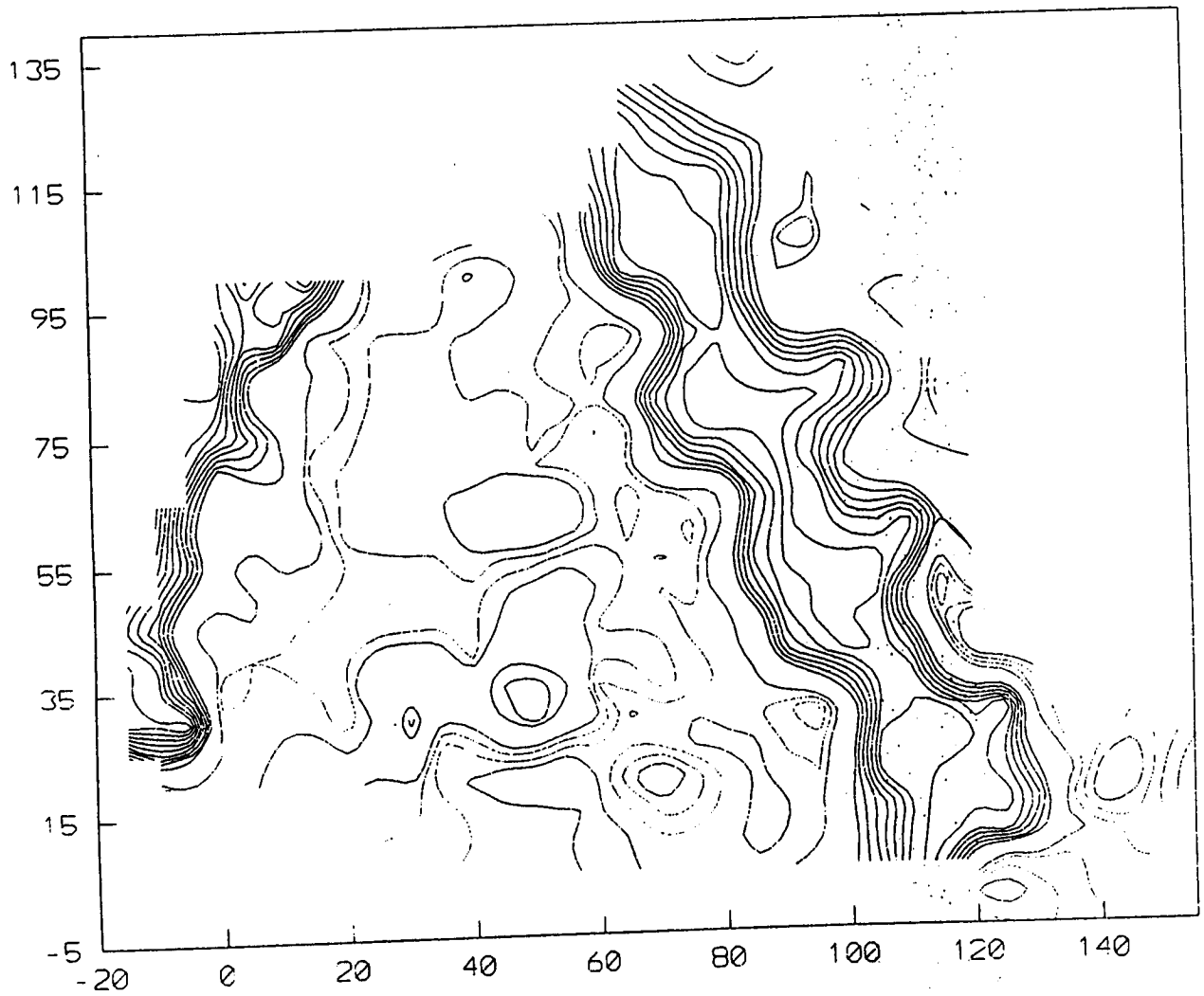
WOD4710 PHASE 06/15



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SV062293 - 24

Field Surveyed By _____
Reviewed By _____
QA/QC Check By _____
Approved By _____

CAUTION
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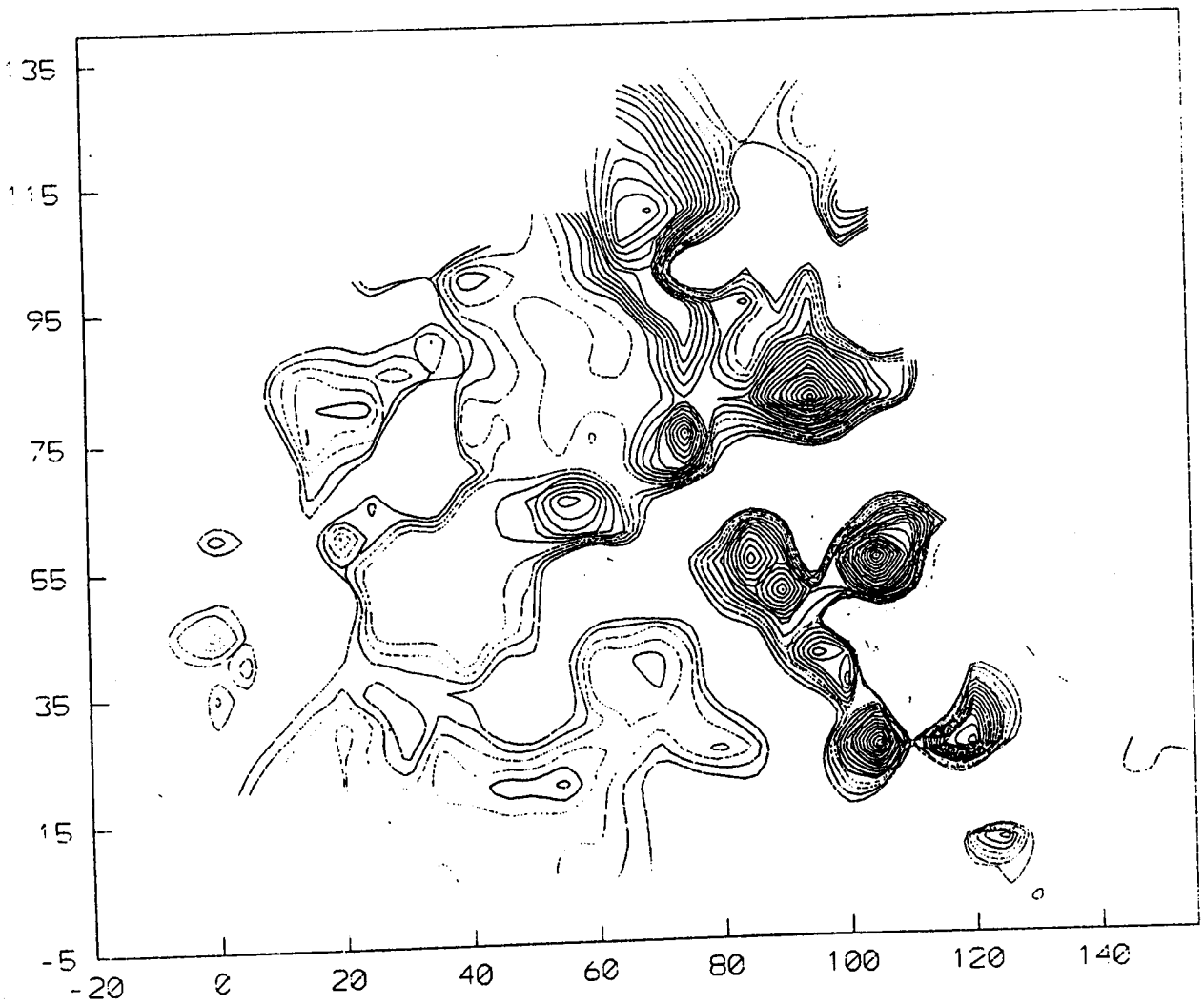
and is not to be used in
place of the consolidated
plots in the final report

WOD4710 QUAD 06/15



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SV062293 - 25

Field Surveyed By _____
Reviewed By _____
QA/QC Check By _____
Approved By _____

Attachment #4

CEHND-ED-SY-S (385-16b) 11 April 1994

MEMORANDUM FOR CEHND-ED-SY-S (Mr. Hank Hubbard)

SUBJECT: 4710 Woodway Street, Zone 4, Spring Valley Project

1. The enclosed report provides the Anomaly Review Board's (ARB) recommendation of no further action for the suspect anomaly at the subject property. The anomaly in question has since been resolved as being associated with buried debris and magnetic rock (see enclosure).

2. The technical evaluation by the ARB of anomalies is consistent with the approved Spring Valley Safety Submission and the ARB Management Plan.

3. If you have any questions or require additional input from the ARB, you may contact me at 205-955-5785.

C. DAVID DOUTHAT, P.E., CSP
Chairperson, Anomaly Review Board

Encl

CF:
ED (Ron Lein) w/o Encl
PM (Leo Carden) w/o Encl
PM-OT (MCX Manager, Rob Wilcox) w/o Encl
CT-D (Dan Biggs/Mary Stringer) w/o Encl

MEMORANDUM

MARCH 30, 1994

TO: CHAIRPERSON, ANOMALY REVIEW BOARD, HUNTSVILLE DIVISION, HUNTSVILLE, AL

SUBJECT: **CEHND INVESTIGATION OF 4710 WOODWAY STREET, SPRING VALLEY**

1. ON THIS DATE I INVESTIGATED THE REMAINING ANOMALY IDENTIFIED BY THE ANOMALY REVIEW BOARD AS A CANDIDATE FOR EXCAVATION FOR THE SUBJECT PROPERTY WITH THE FOLLOWING RESULTS:

A. ANOMALY #1 IS A LARGE (APPROXIMATELY 15 FT DIAMETER) DEPRESSION AREA. I INVESTIGATED THROUGHOUT THIS CIRCLE AND UNEARTHED APPROXIMATELY 78 MAGNETIC ROCKS RANGING IN SIZE FROM A SOCCER BALL TO PEBBLE SIZE.

B. DURING A VERBAL CONVERSATION WITH MRS. HOLMES CONCERNING THIS PROPERTY, SHE INFORMED ME THAT ONE OF THE PREVIOUS OWNERS HAD PERMITTED A ROCK/GRAVEL ROAD TO BE CONSTRUCTED TO THE REAR OF HER PROPERTY, SOMEWHERE IN THE VICINITY OF THIS AREA, FOR ONE OF THE NEIGHBORS TO THE REAR OF HER HOUSE TO USE FOR THE BRINGING IN OF CONSTRUCTION MATERIALS FOR THE CONSTRUCTION OF A SWIMMING POOL.

2. I USED THE "IN-PHASE" & "QUADRATURE MAPS" PRODUCED BY EODT SERVICES TO LOCATE THE ANOMALIES' LOCATION.

3. I USED THE SCHONDSTEDT GA-72 MAGNETOMETER TO LOCATE THE ANOMALIES AND THE MK 26 FOERSTER TO CLEAR SEVERAL OF THE HOLES.

4. BASED ON THE ABOVE, I RECOMMEND THE FOLLOWING:

A. DISMISS THE ANOMALY LOCATION AS FILL/ROAD MATERIAL.

B. WHILE I DID NOT REMOVE ALL OF THE ROCKS, I AM CERTAIN THERE ARE NO UXO OR UXO-RELATED MATERIALS AT THIS ANOMALY LOCATION.

5. INVESTIGATION WAS CONDUCTED IAW SOP, QUALITY ASSURANCE/FOLLOW-ON INVESTIGATION OF SPRING VALLEY PROPERTIES BY CEHND PERSONNEL, DATED 20 JAN 94.

HENRY C. HUBBARD JR.
SAFETY SPECIALIST
HUNTSVILLE DIVISION
SPRING VALLEY RESIDENT OFFICE
WASHINGTON, DC

1ST ENDORSEMENT 1 APR 94

BASED ON THE SITE INSPECTION PERFORMED BY MR. HUBBARD AND THE PHYSICAL EVIDENCE PROVIDED TO THE BOARD, THE ARB CONCURS WITH THE RECOMMENDATION.

10 Apr 94

C. DAVID DOUTHAT
CHAIRPERSON
ANOMALY REVIEW BOARD

FILE: INVES\4710WOO1

Question 13: Is the Army Corps listing specific results of its sampling data or core borings on its Spring Valley Web site explaining the significance of the sampling results to the citizens? If not, please explain why not. Also, please describe what information, and in what form (e.g., written correspondence, verbal or other), information about the cleanup activities is provided to the residents of the Spring Valley community.

The Army Corps is not listing specific results of its sampling data or core borings on its Spring Valley Web site. This information is provided directly to each resident via a letter, phone call, or personal visit. During this communication, we provide the actual test results, their comparison with background values, and discuss their significance in terms of EPA risk standards. For those properties with arsenic above the background range (3.3 to 18 parts per million{ppm}), we provide a five-part question and answer sheet to help them minimize their risk from exposure as we complete the risk assessment/feasibility study prior to any remediation activity (see Attachment 16.1).

The rationale for not posting results on our Web site is a matter of privacy for the residents involved. While they want to know the results, many have indicated in the past that they don't want the information publicized in such an open forum. The results are a matter of public record; however, and will be placed in the Palisades Branch of the Washington, D.C. public library once a final report is completed.

Information regarding our cleanup activities is provided to the residents of the Spring Valley community by several means. First, we host a monthly "community meeting" in which we present the results of past activities (since the last meeting), discuss our current and planned activities, including timelines, and allow the residents to ask specific questions. While this meeting typically draws a half-dozen residents, recent media coverage resulted in a thirty-fold increase in attendance at our last meeting. Please see Attachment 16.1, the agenda and minutes from our last meeting held February 13, 2001 in the Sibley Hospital auditorium.

Supporting our community meetings is a monthly newsletter, *The Corps 'spondent*, which is mailed to all residents in Spring Valley. This includes updates similar to the information presented at the community meeting and includes an invitation/reminder for the time/date of the next meeting. We are also using it to answer questions raised at the community meeting. Please see the attached copies of our newsletter from the past year (Attachments 16.2 – 16.8).

To best address the specific concerns of individual residents, we personally respond to phone calls and letters submitted by all stakeholders. While this can be a time-consuming task, our dedication to providing the utmost customer care demands it. One important tool we use to promote and facilitate our interaction with residents is our information line. This 800-number links residents with our District's Public Affairs Office, which is able to answer many residents' questions. When residents have more technical questions they are linked to the project manager who then answers the question himself, at times with the assistance of our technical staff. This info line number, which is listed both at our Web site and in *The Corps 'spondent*, is 1-800-434-0988. Our goal is to respond to all inquiries within 48 hours.

A final medium used to communicate with residents is our Web site www.nab.usace.army.mil/projects/WashingtonDC/dcprojects8.htm (see Attachment 16.9). This provides Project Overview information (maps of current sampling areas, Q&A, minutes from community meetings, news release, etc.) as shown in Attachment 16.10. It also provides several Spring Valley project maps and the 1918 aerial photograph used by EPIC to help identify areas of possible contamination (see Attachments 16.11 and 16.12).

Attachment 16.1

Frequently asked Questions and Answers
Concerning Arsenic Contamination

Question 1: What are the health risks associated with arsenic?

Answer 1: As with any contaminant, health risks as a result of exposure are dictated by the toxicity of the contaminant, the route of exposure, the length of time one is exposed to contaminant, and specific characteristics of the person exposed, such as age and weight. In the case of arsenic, available scientific data indicate that arsenic can damage various tissues within the human body. Significant exposure to arsenic can cause non-carcinogenic and carcinogenic effects. Non-cancer effects include nausea, rashes, blood vessel damage and decreased production of red and white blood cells. Cancers associated with arsenic exposure include skin cancer and tumors of the bladder, liver, kidney and lung. Additional information regarding these and other health risks is available by contacting the Agency for Toxic Substance and Disease Registry (ATSDR) at 1-888-422-8737.

Question 2: Where is arsenic found in the environment and what are the general routes of exposure through which a person can be exposed to environmental contaminants?

Answer 2: Arsenic is found in throughout our environment to include the soil, groundwater and air. Arsenic is also found in food and in the workplaces of industries that use arsenic. As a naturally occurring compound, people are normally exposed to small amounts of arsenic through dermal absorption (through the skin), inhalation (the air we breathe), and ingestion of the water we drink and food we eat. In areas naturally high in arsenic or at hazardous waste sites where arsenic is a potential contaminant of concern, a person's exposure to arsenic can be higher. Compared to other sources, soil usually contains the most arsenic

Question 3: How can the public be exposed to arsenic in soil?

Answer 3: The public can be exposed to arsenic through direct contact with the contaminated soil, i.e. absorption through the skin, (according to EPA Region III, less than 5 percent of the arsenic in contact with the skin is actually absorbed). ATSDR does not consider dermal absorption of arsenic to be a route of concern. Secondly, incidental ingestion via hand-to-mouth activities - this route would be of particular concern for children who tend to ingest relatively large amount of soil for their body size. Thirdly, inhalation of small dust particles - small dust and soil particles (usually less than 10 μm in diameter) are inhaled and then absorbed via the lung. Thick grass areas or groundcover significantly reduces wind born dust levels. Fourthly, ingestion of garden crops grown in contaminated soil – root and tuber vegetables were shown to absorb arsenic from soil treated with arsenic contaminated sewerage sludge. Soils with a low pH seem to allow for more arsenic to be taken up by the plant, than do soils with a higher pH factor.

Question 4: What steps can the public take to reduce exposure to arsenic in the soil?

Answer 4: One way to reduce your exposure to arsenic in the soil is limit intensive soil activities, e.g., gardening, planting flowers, and wear gloves and other protective clothing to limit contact when doing any necessary yard work. Secondly, avoid eating home grown vegetables, e.g., spinach, broccoli. Thirdly, avoid eating canned or pickled vegetables grown in the past especially root and tuber crops. Fourthly, re-schedule landscaping or other activities that could create dust or otherwise disturb the soil. Additional ways, maintain a healthy grass or other groundcover which will provide a barrier between residents and contaminated soil, and avoid tracking mud or soil into the house on shoes and clothing.

Question 5: What is the process that will be followed to evaluate the potential health risk at my property?

Answer 5: The health effects from long-term exposure to the arsenic in the soil at your property will be determined using approved EPA methods. The methods to be used will focus on hypothetical exposures that should overestimate the actual exposures of any given resident. By overestimating exposure, and thereby over estimating any health effects, the assessments are conservative and protective of human health and the environment. The risk assessment should not be viewed as a prediction of any individual's risk of adverse health effects. Specific health effect information should be discussed with ATSDR or your physician.

ACRONYM LIST

ABP	Agent Breakdown Products
AEC	Army Environmental Center
ANOVA	Analysis of Variance
ARARs	Applicable or Relevant and Appropriate Regulations
ARB	Anomaly Review Board
ATSDR	Agency for Toxic Substances and Disease Registry
AU	American University
AUES	American University Experiment Station
CEHNC	Huntsville Division, USACE
CENAB	Baltimore District, USACE
CDC	Centers for Disease Control
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulation
CV	Coefficient of Variation
CWM	Chemical Warfare Material
CWS	Chemical Warfare Service
DANS	Data Acquisition and Navigation System
DCOEP	District of Columbia Office of Emergency Preparedness
DCRA	District of Columbia Department of Consumer and Regulatory Affairs
DERP	Defense Environmental Restoration Program
DoD	Department of Defense
DQO	Data Quality Objectives
EE/CA	Engineering Evaluation/Cost Analysis
EM	Electromagnetic
EMS	Environmental Management Systems, Inc.
EPIC	Environmental Photographic Interpretation Center
ERDEC	Edgewood Research, Development, and Engineering Center
ESI	Expanded Site Investigation
FDES	Findings and Determination of Eligibility Study
FS	Feasibility Study
FSP	Field Sampling Plan
FUDS	Formerly Used Defense Sites
GC/MS	Gas Chromatograph/Mass Spectrometer
GIS	Geographic Information System
GPR	Ground Penetrating Radar

ACRONYM LIST
(Continued)

HD	Distilled Mustard
INPR	Inventory Project Report
L	Lewisite
MDRD	Minimum Detectable Relative Difference
MRI	Midwest Research Institute
NTCRA	Non-time Critical removal Action
OE	Ordnance and Explosives
OEW	Ordnance and Explosive Waste
OSR	Operation Safe Removal
OSR FUDS	Operation Safe Removal Formerly Used Defense Site
OSWER	Office of Solid Waste and Emergency Response
OU	Operational Unit
PA	Preliminary Assessment
PAHs	Polynuclear Aromatic Hydrocarbons
Parsons ES	Parsons Engineering Science, Inc.
PCB	Polychlorinatedbiphenyl
PIRP	Public Involvement and Response Plan
POI	Point of Interest
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
QAPjP	Quality Assurance Project Plan
QC	Quality Control
RAGS	Risk Assessment Guidance for Superfund Human Health Evaluation Manual
RBCs	Risk-Based Concentrations
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
ROE	Right-of-Entry
RTAP	Real-Time Analytical Platform
SHERP	Safety, Health, and Emergency Response Plan
SVOCs	Semivolatile Organic Compounds
SVRO	Spring Valley Resident Office
TAL	Target Analyte List
TCL	Target Compound List
TEC	Topographic Engineering Center

ACRONYM LIST
(Continued)

TEU	Technical Escort Unit
TICs	Tentatively Identified Compounds
USACE	US Army Corps of Engineers
USACE-TEC	US Army Corps of Engineers, Topographic Engineering Center
USATHAMA	US Army Toxic and Hazardous Materials Agency (now AEC)
USEPA	United States Environmental Protection Agency
UXO	Unexploded Ordnance
VOCs	Volatile Organic Compounds
WWI	World War I